UNITED STATES DEPARTMENT of COMMERCE
COMMERCE SPECTRUM MANAGEMENT
ADVISORY COMMITTEE (CSMAC)

TRANSCRIPT of the MEETING of
Thursday, March 1, 2012
Stanford Institute for
Economic Policy Research
366 Galvez Street, Koret-Taube Room
Stanford, California 94305

CSMAC Members Present:
Larry Adler
David Borth
Michael Calabrese
Martin Cooper

Mark E. Crosby
Gary Epstein
Margaret Feldman
Harold Furchtgott-Roth
H. Mark Gibson
Dale N. Hatfield
Kevin C. Kahn

Doug McGinnis
Mark A. McHenry
Carl Povelites
Richard Reaser, Jr.
Dennis Roberson
Charles M. Rush
Daniel Dean Stancil

Bryan Tramont
Jennifer Warren

National Telecommunications Information Administration (NTIA) Staff present:

Karl B. Nebbia, Associate Administrator, Office of Spectrum Management

Lawrence Strickling, Assistant Secretary for Communications and Information

Bruce M. Washington, Designated Federal Officer, Chief of Staff, Office of Spectrum Management

CONTENTS

PROCEEDINGS

(9:00 a.m.)

CO-CHAIR FONTES: Okay. Why don't we just go around the table and then we'll call out the names of the people we think are on the phone. And then you can say yes on the phone.

So you want to start, Larry?

MR. STRICKLING: Larry Strickling, NTIA.

DR. ADLER: Larry Adler. I'm with Google.

DR. KAHN: Kevin Kahn, Intel.

MR. EPSTEIN: Gary Epstein, Aspen.

DR. STANCIL: Dan Stancil, North Carolina State.

MS. FELDMAN: Molly Feldman, Verizon Wireless.

MR. POVELITES: Carl Povelites, AT&T.

MS. WARREN: Jennifer Warren, Lockheed Martin.

MR. GIBSON: Mark Gibson, Comsearch.

MR. HATFIELD: Dale Hatfield. I wear several hats, but probably University of Colorado is the most pronounced.

CO-CHAIR FONTES: That'll do for today.

MR. HATFIELD: Right.

MR. MCGINNIS: Doug McGinnis, Exelon.

DR. FURCHTGOTT-ROTH: Harold Furchtgott-Roth, Furchtgott-Roth Economics.

MR. NEBBIA: Karl Nebbia, NTIA.

CO-CHAIR FONTES: Brian Fontes, National Emergency Member Service, Co-Chair.

CO-CHAIR ROSSTON: And Greg Rosston, Stanford.

So on the phone. I'm going to go through alphabetically on the phone, so if you can just say your name after that.

David Borth.

DR. BORTH: Yes, I'm here.

CO-CHAIR ROSSTON: Michael Calabrese.

Marty Cooper.

Susan Crawford.

Mark Crosby.

David Donovan.

Dennis Roberson.

Charles Rush.

MR. MCGINNIS: It's like they're all hanging up after you call their name.

CO-CHAIR ROSSTON: Brian Tramont.

MR. TRAMONT: Here.

CO-CHAIR ROSSTON: Yay, we got somebody. At least the phone's still working, we know that.

Did anyone else join? We heard a bunch of beeps on the phone.

DR. MCHENRY: Mark McHenry here.

CO-CHAIR ROSSTON: Okay.

DR. RUSH: Charley Rush joined.

CO-CHAIR ROSSTON: Okay.

CO-CHAIR FONTES: Anyone else?

Okay. Well, welcome, everyone, here to Stanford. Happy, glad to have you out here. Sorry we didn't have the sunny California weather for you, but it's still California. And we appreciate -- so, you know, there's been an incredible amount of work done and work product done for this meeting. And we appreciate all the hard work and think that there's still more to do. And we're happy to keep addressing the questions that NTIA is posing and to have the back-and-forth.

So we're going to start with Larry Strickling giving some opening remarks.

CO-CHAIR FONTES: There were three more people that joined the call.

CO-CHAIR ROSSTON: Okay. So who just joined?

MR. CALABRESE: Michael Calabrese is here.

CO-CHAIR ROSSTON: Okay.

PHONE PARTICIPANT: David Fritson, the Mitre Corporation.

CO-CHAIR FONTES: And was there someone else that joined?

PHONE PARTICIPANT: Mark Onpepper, TIA.

CO-CHAIR FONTES: Great.

MR. COOPER: Yes. Marty Cooper, Dyna.

CO-CHAIR FONTES: Hi, Marty.

MR. COOPER: Hi.

CO-CHAIR FONTES: We're just getting started, everyone.

CO-CHAIR ROSSTON: Okay. So, Larry.

WELCOME and OPENING REMARKS

MR. STRICKLING: Well, thank you, Greg. And thank you for hosting.

When we were recruiting Greg to be the Co-Chair of this iteration of CSMAC, one of his conditions was that we hold at least one meeting in California, and for which there really we put up no resistance as to that idea whatsoever because the idea of being out here

in the beginning of March, we figured we'd catch some good weather. And I think the weather will still turn nice her for the rest of the day.

But anyway, Greg, thank you for hosting --

CO-CHAIR ROSSTON: Sure.

MR. STRICKLING: -- in this wonderful facility here.

I want to welcome all of you who have joined us in person and by phone. Needless to say, this is a busy and a rich time for spectrum issues. Unfortunately, some of them we won't be able to talk about today because they're so new, but I think everyone is aware of the legislation that Congress passed a couple of weeks ago to authorize incentive auctions at the FCC, but also giving NTIA a lot of new work to do, in particular, standing up the first net board to build the $7 billion public safety network as well as tasking us with a number of very specific

spectrum-management issues and some reports that we're going to have to conclude and a rulemaking that we'll have to conduct in the next six months on the issue of the technical review board for federal agency transition plan.

So I think some of these topics will be things we'll want to bring back to CSMAC and perhaps have a discussion on it our next session. But the bill just having -- or the law just having been signed about ten days ago, it really -- and the agenda having been set for this meeting before really didn't provide much of an opportunity to get it on today's discussion.

So I know folks are still waiting to see our 1755 report, and we'll be talking around it today. I'm hopeful it will come out shortly. We have some slow readers at our sister agency and --

(Laughter.)

MR. STRICKLING: -- maybe now they

will be able to pick up the pace a little bit and get this thing finally cleared and out so that everybody can see it and we can move ahead with a lot of what will be very important tasks coming out of those recommendations.

So with that I think we'll go right to today's agenda, and I'll turn it back to Greg and Brian. Thank you.

CO-CHAIR FONTES: Great. There were a couple of more people that joined the call during Larry's comments. If we can get your name so we can mark it here on the roll.

MR. ROBERTSON: Dennis Roberson here.

MR. CROSBY: Mark Crosby here.

PHONE PARTICIPANT: Alexander Gavinich, Motorola Mobility.

MR. SHARKY: Steve Sharky, T-Mobile.

CO-CHAIR FONTES: Okay. I think that was probably it in terms of the new

calls.

Okay. At this point, Karl.

NTIA REVIEW of CSMAC RECOMMENDATIONS

MR. NEBBIA: One of the things that we felt was important for us to do as we have been moving forward in the committee work was to return to the recommendations that had been made thus far and to give you feedback regarding the NTIA views on those recommendations.

We actually have some reporting requirements under the FACA rules where we need to report, I believe it is, annually regarding how many of the recommendations we have implemented and that sort of thing. And, as we have discussed in the past at times in some of the early recommendations, it was a challenge to figure out exactly what the recommendation was. And certainly the group, I think, has done a terrific job in moving that forward and being more specific about what they were recommending. It doesn't mean

that in every case we're not going to have questions, which I think we very likely will. And I will highlight some of those this morning.

But, nonetheless, we wanted to get back with you and kind of let you know what our thoughts were on the recommendations that are provided. So we have provided a document to you. You should have that circulated, but there are also copies on the table out there.

And, Bruce, I don't know if we can -- can you bring what's left over there, so if anybody hasn't got it, they can -- you can just kind of run them around?

MR. WASHINGTON: Sure.

MR. NEBBIA: But, nonetheless, let me begin. First of all, we look back over the recommendations from the most recent to the oldest set that we had not provided feedback on. If you will remember, there was a couple summers ago I gave a briefing there on our responses to the initial set of

recommendations that we had been provided.

So what you have before you includes all the recommendations that have been made since that time, with the exception of the recommendations that were made by a working group that dealt with interference and dynamic sharing. That was kind of an odd mixture of topics for a group. But, nonetheless, our challenge here in putting this together is that in their document there was about 15 pages of individual recommendations. And we just didn't have a chance to get through them all, so they were very, very numerous.

So let's start with the "Search for 500 MHz." The first case of using the LTE characteristics that were provided by the Committee. NTIA has, in fact, used those in its analysis of this band, so when that report comes out you will see that they were the characteristics that we did, in fact, use in that effort.

I think as we go forward and there's any more discussions between government and industry related to that band, we will probably need more refined characteristics in some cases to try to fine tune any sharing type of interaction or transition, and so on.

With respect to -- and please feel free if you have a question along the way, to stop me at any point.

In implementing the process --

PHONE PARTICIPANT: A question? A question. For those of us that are on the phone, where we would find the materials that you're talking through?

MR. NEBBIA: It's -- I think the file name is "NTIA Response to the CSMAC Recommendations." And it's on the website.

PHONE PARTICIPANT: Thanks. Got it. Got it.

MR. NEBBIA: Okay. So the second thing was setting up this informal process,

consistent with applicable laws. We believe and agree that some sort of face-to-face discussions is going to be critical to moving the ball forward in any band, not just the 1755-1850, but any band that we relocate from. We don't have many choices, I think, ahead of us, where it's likely that we could, for instance, just move out of a band without any interaction with those who are coming in. And we certainly found in our experience with the 1710-1755 move, having understanding between those coming in and those vacating is absolutely critical to the process.

In this case we have asked one of our working groups to consider the nature of this, and we'll be talking about that a little bit later.

Using the idea --

DR. KAHN: Karl?

MR. NEBBIA: Excuse me. Yes?

DR. KAHN: More generally, and it goes to this point and others I think, there

seems to be, you know, a reasonable amount of work getting geared up in places like ATCE on future sharing protocols and, you know, sort of advancements to that whole set of standards, LTE and others, to sort that out.

Are you guys at least going to monitor that kind of stuff and hopefully maybe even participate to some degree in that as it goes forward?

MR. NEBBIA: Yes. And that was -- probably you should mention your name so those --

DR. KAHN: Oh, I'm sorry. Kevin Kahn.

MR. NEBBIA: -- who are on the phone know who's speaking.

But my sense in that is certainly industry is directly working in that for their own sharing reasons, that I think ours are such that or our uses are such that we would probably be looking for the outcome of that kind of work as opposed to trying to influence

it around what types of systems the government has. So at this point we're not engaged in it so much as looking for the outcome and see what people are using. And so --

DR. KAHN: Yes. I guess my only comment on this is it seems to be a fairly open field with a lot of, you know, early ideas being germinated by, you know, kind of the major players across the commercial side. And the form that those standards evolve toward might be, you know, more or less helpful, right, to the long-term processes that you guys have to deal with, so I -- even if you don't want to engage it in a super direct manner, at least I would strongly suggest you guys monitor carefully, because, --

MR. NEBBIA: Okay.

DR. KAHN: -- you know, if that goes off in the weeds somewhere, from your perspective that's bad. On the other hand, you know, they might just make some arbitrary

choices that can be made in a way that's more helpful or less helpful to some of these, you know, we're moving in, you're moving out, and other similar --

MR. NEBBIA: Right.

DR. KAHN: -- kinds of things.

MR. NEBBIA: Okay. Okay. With respect to the staging issue, certainly we understand the value in doing that. At the same time we have to safeguard agency mission. So if there's staging involved with the process of moving out of a band, we have considerations like the fact that some of the systems may operate across the entire band and may not, in fact, be able to conduct their full mission in a situation where they've lost a number of the channels that were available to them.

So I think staging is important, and we'll be looking at that certainly in our 1750-18- -- 1755-1850 report, and consider that for the future.

But I think as noted in Janice's additional comments, the aspect that some of the systems that we have are very likely to operate across the entire band is going to be an issue that we'll have to work with.

MR. EPSTEIN: Karl?

MR. NEBBIA: Yes.

MR. EPSTEIN: Gary Epstein. You --

MR. NEBBIA: Can you get -- can you pull the mic over, Gary? That works for the phone, but not for...

MR. EPSTEIN: Do you foresee asking this particular subcommittee once the 1755 report is out, to focus in on those specific questions with respect to the report?

Because we've been unable to do that, you know, to date, and that may be a next task.

MR. NEBBIA: Well, I think -- obviously what we've asked initially is what kind of construct you would see in us putting

together an industry government forum, staying within the various requirements of the law.

My -- my view, I guess, is that in setting up that, that that's where most of that detailed discussion would come up and that for this Committee, you would probably be moving onto other -- you know, other aspects once we've engaged that.

We have some thoughts that we'll talk about when that working group comes up as to maybe some other things that they could look at also, at least at this time, so.

Okay. The last item was: Making spectrum available to the commercial users on an exclusive use. I think certainly everybody sees that that is what, you know, gives the commercial user the most flexibility, probably the best value in terms of choices and their ability to progress their work plan.

However, I think the reality is that we're going to face a couple issues. One is the difficulty of moving some systems out

of bands in the future. So we may be in a situation where a shared environment becomes the long-term reality.

Another aspect is the fact that, once again, when we moved the last time, where we had -- we had a combination of two types of things in 1755-1850 -- or, excuse me -- 1710-1755. We either had fixed-microwave systems that we knew could be moved in, let's say, one -- one-to-five-year period, depending on snowfall. It seems like that was one of the impacting things, because they're remote areas oftentimes.

And then the other systems that we had in there had the entire 1710-1850 range to operate in. And, for the most part, they -- they decided that they could live without that lower portion.

So, in essence, immediately they moved to a situation where they were using the spectrum above 1755, so there was little in terms of a true kind of transition, you know

portions being moved at bits at a time, and so on. In the future, the systems that we have in the 1755-1850 band or other bands the federal agencies have are probably going to experience much longer transitions, parts of them moving over a period of time. And, therefore, the issue of sharing may not be the final outcome that sharing is required. But certainly the transition periods are going to be long enough that somehow we're going to have to work through sharing concepts.

So, once again, if the goal still is exclusive spectrum, I think that's certainly an understood goal, but I think many of the practical realities are going to say either in the end we can't get there or the transition is going to be long enough that you're still going to have to deal with these sharing concepts.

Okay. Any other questions on -- on that group of recommendations?

No? Okay. The second one, the

spectrum management improvements, I actually inserted in the text here some areas where some feedback that we're looking for, the committee, I think there's agreement all around that we would love to have a database that was clean and perfect. We would like to be able to go through all those records, but we have about 250,000 government records. And even, you know, trying to do them over a one-year period or a five-year period, to think we're going to go through all those records at a level of depth where we know for a fact that, yes, the date is all accurate on these records, would certainly be extremely challenging to do that.

So we were looking for more clarity as to how the Committee would expect that that would be done. That is somewhat incorporated in the other recommendations, however, that you recommend a system of priorities or choosing bands that you're going to do, and limiting the work, establishing

goals and so on along the way.

So I think in this context we would appreciate any guidance that you can provide back as to how you think we should choose the bands that we do. One of the possibilities, of course, is that we do the 1755-1850. But actually if we get into a relocation of that, there's going to be a process of the companies laying out their locations and information about their uses. So that may actually be -- the improvement of that data may be incorporated in that process, as opposed to being a separate process. But any, any input that you can give us along the lines of determining what those priorities should be and what you actually think is, you know, certainly critical for us to check in those, so.

MR. GIBSON: This is Mark Gibson.

CO-CHAIR ROSSTON: Mark.

MR. GIBSON: I just want to make -- is this on? I want to make a comment.

And, you know, we mentioned in this report and we mentioned in what we're going to present today that it would be helpful to have some visibility into the architecture, at least the data architecture behind FSMS. Because knowing that will help us better give you some direction as to how what we're thinking will impinge on that develop or be able to work through -- with that development.

For example, the suggestion about normalizing the data elements and all that, and setting up tables. So if we know that, then -- Dan, and you and I talked about this -- one suggestion would have been just initially do this using software in scripts, you know, because you can clean a lot of data doing that.

My next question is: Are you looking for a report back from us on this then as sort of an addendum to the original report? I'm not --

MR. NEBBIA: Yes.

MR. GIBSON: Okay.

MR. NEBBIA: I think that would be very helpful --

MR. GIBSON: Okay.

MR. NEBBIA: -- just as, you know, a small addendum to what you've got, --

MR. GIBSON: Okay.

MR. NEBBIA: -- whatever --

MR. CROSBY: This is Mark Crosby, Karl and Mark. And what -- then I'm working on the Committee with Mark. I'm going to make -- hopefully we can make the assumption that NTIA is in support. I know it's going to be an arduous process, Karl. And whether it takes one year, two years, three years, five years, or ten years, I assume that this is something that is supported by you and NTIA, and -- because I think that would be in our report.

I mean and I know it's difficult, but we ought to pick a date and even if we do

it in pieces, I think the end game is still valuable. And I think -- hopefully it's still valuable to NTIA. But so I -- I get a little concerned when you say this is going to be an arduous process.

Absolutely. And if it was easy, we wouldn't -- I don't think we'd be talking about. But I think it's something we got to get to. And I just hope that that is -- that view is shared by you and perhaps others at NTIA. That's all.

MR. NEBBIA: No. I think certainly it would be a very valuable effort. In fact, in our efforts to work on FSMS, one of the components of the plan was a review of the data. At this point I think one of the challenges is what that entails and how much it costs to do that.

And we've noted under point 6 of the recommendation is that the working group attached a particular expected tab to that effort of between 2 and $4 million. I think

that's noteworthy. And that becomes part of the -- part of the issue. But I think even 2 to 4 million is probably not a cost that one would associate with a specific effort to go out and verify the data on all 250,000 records, that that's still, even for the 2 to 4 million, has got to be some sort of focused effort and so on.

Now the other possibility of course is that as we're putting together FSMS, and that ties into some of the other recommendations, we are expecting that there is going to be data entry components that screen the data, that funnel the data into proper formats and numbers that make sense and that sort of thing, but we'll also be including in there this idea of a distributed characteristics database related to parts of the equipment, and that will help also.

So part of the question here, Mark, in the end, because of the cost, still gets to this issue, well, as we're putting

FSMS online, do we use that as the primary technique to ensure that the data is being put in correctly and that it makes sense; or do we go out on some additional, very focused, directed effort on reviewing all the data of these assignments. And so I think that's the challenge here: What do we in a focused way, what can we accomplish that's of value, because certainly reviewing in detail all 250,000 is not going to be a 2 to $4 million effort. It's going to be significantly more than that.

Not to mention the fact that even after you review the data, that still doesn't confirm for you that the system is actually at the location and operating. So you then have the choice, well, does the process here involve face-to-face, you know, going out to the sites; 250,000 is too many, obviously, to do that.

DR. KAHN: I think -- this is Kevin Kahn.

MR. NEBBIA: That's Kevin.

DR. KAHN: I think, though, I mean I sympathize with the problem you've got. It's a huge one, so I'm not going to make light of that at all, and finding a way to get there is going to be critical. But, you know, a couple of observations.

One, you know, creating FSMS -- I can't get it out of my mouth.

MR. NEBBIA: We wrote it just for that purpose.

DR. KAHN: Yes. I have yet to be able to say that smoothly, so I'm not even going to try.

But, you know, creating what appears to be, right, a much more comprehensive and integrated and interactively-available, automated-available database full of bad data accomplishes nothing, right? I mean, you know, you can have incredible precision and if it's all wrong, this doesn't help anyone, you guys or

the people who want to access it.

So while I understand the concern in trying to move to the new databases and the new systems, you're going to have to find some way as data goes into that database to at least flag it as it has been verified or not and the level of reliability you associate with it. And there's going to have to be some kind of a score across the databases to, you know, -- whether it's, in fact, good enough to be useful. So I think that's sort of -- that's an issue you have to kind of figure out your way around, even without asking for an audit or a review of all of the records you've got.

The other thing is that, even having done that, you really need processes and procedures well characterized for maintaining the data quality over time, because even if you did a fantastic review of all your Herculean effort right prior -- enough people to take our unemployment rate in

half and reviewed all 250,000 records, you know, you say, great, we've got a great database, a year from now is it still a great database? Well, only if on a continuing basis there is a way to validate the data.

And I think that's one of the reasons why in the last go around we had a lot of discussions about how do you export the responsibility for the continuing accuracy of that data to the people who are making the entries in the database. How do you force that responsibility to the owner of the record, as opposed to the kind of database itself.

And I think comprehending both of those things in some cohesive plan is going to be required or you're going to do an awful lot of work here and wind up, you know, with something which is not a hell of a lot of use in the long run.

MR. NEBBIA: Well, certainly, I think, as we transition to the FSMS and I

think, once again, the validation checks built into the system will be significantly greater than what we have now. The system characteristics databases and so on will help in that process.

I think we're certainly, if nothing else, you will see an improvement over that period of time. Now certainly at the same time, though one could take issue with specific components of our data today, the database has, in fact, functioned in that we've been able to perform spectrum management through the many years and continued to do that without people interfering with each other all the time.

So we have been functioning based on what we have. Perfectly? Obviously not, but that's reality. The same way that the Commission is functioning right now essentially on an admin or licensing database, okay. They don't have a compatibility database, and so on. So --

DR. KAHN: I agree with that, but I think you're still missing one -- now I could be completely wrong about this, but when I look at what's happening in the radio world here, the sort of sea change that seems to be underlying a lot of this is the notion of automated mechanisms to allow for access to spectrum.

And there's a huge difference between saying, well, you know, we're managing -- you know, we're managing to handle things where it means that an engineer goes into this collection of information and makes an evaluation and, you know, et cetera, et cetera. And being in a world where what we're talking about is mechanisms where autonomous systems are on a dynamic basis querying some data in order to figure out whether they can operate or not.

Now maybe we're not headed there, right. But all the indications around the industry seem to be that's where people want

to go. So while I applaud your ability to manage the spectrum, you know, with the shackles you've got on today, don't underestimate what it means when it's not an educated engineer staring at those pieces of information and making judgments and going, 'Oh, yes, but I think I remember, you know, there's this like other guy who's in that band, and we ought to go check on him,' but rather, you know, some wacky algorithm in some radio someplace that's coming in and looking at the database and trying to make a judgment.

So I think that's the underlying sea change that I'm worried about, is that if, in fact, the world moves to more of an automated, sharing approach, that the criticality of these databases becomes much, much higher. And the tolerance for errors in them goes way down because it's not a smart person anymore, it's a system.

MR. GIBSON: Well, and what you end up having to do then is design a sharing

protocol that anticipates bad data.

DR. KAHN: Right.

MR. GIBSON: And that's kind of what we've done with white spaces.

DR. KAHN: Yes.

MR. GIBSON: If you compare that to the off-come approach, but that's not what this is all about. So I think I understand what you're saying.

I think with respect to the last report, you know, and let me actually see what you think about this. We'll take some of these suggestions and blow them up a little bit, or stand a little bit, and the 2 to $4 million was not for somebody to go out and do site audits. You know, that was basically an office paper type study, but I think I know what we need, so.

MR. NEBBIA: And, for instance, most of our assignments are for fixed and mobile --

MR. GIBSON: Yes. Yes.

MR. NEBBIA: -- systems. Most of them. The vast, vast majority of them. The issue we run into there is they're often in fairly small bands that may not be of much interest to people.

So we can go out and do a lot of detail work on 162 to 174, where most of federal land mobile systems are. But does that -- so I think the concept of prioritization is important, yes.

DR. KAHN: Yes. Triage is probably the right approach here, yes. No question.

MR. STRICKLING: Can I just make a couple comments, though? Because I don't want people to get the wrong impression. These are difficult issues, but Karl and his team are absolutely dedicated to getting good data here.

DR. KAHN: Yes.

MR. STRICKLING: We have to approach it in a way consistent with the

resources we have been given to do these things. So, at a minimum, we should make sure that as FSMS comes online, any new data going into that really ought to meet this standard of data quality, data accuracy. And, to the extent the Subcommittee wants a briefing on FSMS, we should make that happen so that you all can see that that's going to work.

Now, in fact, it will continue to be attached to the old database for a number of years. So it will be a gradual transition. And there is a process in place now where agencies are supposed to come back and revalidate the request for spectrum. I think it was at a five-year cycle, Karl?

MR. NEBBIA: Yes.

MR. STRICKLING: We need to make sure that the standards for that measure up to the demands for data accuracy that we need.

Then I think you get to this third category, which is this embedded base of assignments, and what can you do with that.

That's where the additional resources are needed.

And the thing to keep in mind, it isn't just us. I mean because at the end of the day it's going to be these agencies that have to come up with this, and they're asking where are the resources for as you to perform all this additional work, if you're going to make us go back and deal with that embedded base over a one-, two-, five-year period, whatever it's going to be. So these are all things we want to work out.

But there's no question here about the commitment to data accuracy. I mean, Kevin, your point is very well taken, which is we can't have a $40 million new system and then have crappy data in it. And I think we all recognize that and a lot of work to prevent that from happening.

DR. KAHN: Fair enough.

(Off mic conversation)

MR. HATFIELD: I should know the

answer to this, but has a sampling been done of the existing database? Because if you're saying, I think, that some of these bands are not very interesting and therefore they are not a high priority, do you have a sense of are certain records better in certain bands than they are in other that would also give you some idea of what your sort of existing error rate is; has that been done? You know, take a couple hundred, I think you can learn a lot by a couple hundred samples.

MR. NEBBIA: Well, I mean certainly where we have had -- yes, thanks Bruce -- where we've had issues related to data accuracy in the past, it has been almost always among these fixed and mobile multi-link type systems. And also because they're so numerous, they're also the ones that tend to be still in the database, even after they've been taken down. Whereas, you would think the FAA air traffic control radars, you would think it's probably not very likely that their

locations and how many of them are out there is going to be bad data.

There are also all modifications of similar systems, so the system characteristics should be fairly well set. So at least from our culling or running into problems in the past, most of the ones that had been brought to our attention have been fixed or mobile systems, once again, I think possibly due to they're so numerous, people don't take them out of the database when they were gone. And there have been some, you know, obviously data inaccuracies in them.

But other types of bands, we looked at the GPS bands. We know the GPS characteristics are what they are. You know, there's -- so I think there is a prioritization that we could do. Am I am -- I have been running out of the time that I have.

I should note also that we have implemented a system now where the local user

needs to provide their name in the assignment process, and then somebody from the Agency itself is also putting down that they've confirmed that the data is correct, so we're at least on an administrative approach trying to move that forward.

We also had recommendations, and I appreciate Larry's note about the Agency user, so I have asked Mark that you take a quick look at, you know, you're 2 to $4 million reference number and say, well, we are we expecting from folks in the field. If, you know, you consider that.

On the incentives portion. That was the last recommendation put out by the previous group.

Sorry, Jennifer, you had a question before I move on. I didn't mean to...

MS. WARREN: I figure your time is extended --

MR. NEBBIA: Yes.

MS. WARREN: Numbers have questions.

CO-CHAIR ROSSTON: Yes. One of the things that Brian and I just talked about is that maybe the idea would be for a call to go to high level and when we get to these different groups, you can come back to the recommendations, because I think, for the most part, we'll have time. But if you have a quick question, that would be great.

MS. WARREN: I'll wait, if you want.

MR. NEBBIA: Okay. With respect to the incentives aspect, of course the main recommendation was that we study implementation of spectrum fees for the federal government. And I think what you will see here related to our response to that recommendation is, first of all, NTIA did draft a plan on this issue back in the mid 2000s. And I think after three years, it was in fact approved, just before the

administration changed.

So it involved a whole series of subtasks in studying this issue. And essentially due to funding constraints and so on, we've just not taken that up.

Further, now the CSMAC recommendation, I think, was a little bit more narrow than what this plan we had laid out. And yet one of the, concerns for me is there is essentially kind of a one-statement recommendation to consider fees and then the built into the recommendation are lists and lists of things to consider in doing that.

So essentially the easy part of the study has been done by saying: Please study this. The real work is in looking at all of those difficult challenges. So we've kind of enumerated in here what those are. And we will -- at this point our plan is to at least bring this issue before a policy and plan steering group for their consideration and response. Because ultimately for NTIA to

change the method it uses to charge agency fees, we're going to have to have --

(Cellphone chime.)

MR. NEBBIA: -- we're going to have to have a legislative change. So right now we do not have that authority. So it's going to have to be worked at that level and considered by the administration.

Also the recommendation regarding Circular A11, I should note that that was included in the recent law that was passed. And, therefore, that will be taken up. So that's one we didn't even, I guess, get a chance to provide a response on. So we will take that up.

Actually, it's for OMB to take up by the recommendation, so OMB will be looking at A11 in the weeks ahead. And, once again, I think that's an area where we'll probably have some discussion of that inside the policy and plan steering group. So I did include all the text of those parts, just so everybody

could see what that was.

And then the last part of that recommendation was to broaden the CSCA spectrum relocation fund, which the administration supported in the legislation. And that was done, I think, in accordance with the administration's desires in every part except that they did not include planning funds for dealing with unlicensed. They included for other kinds of sharing, included it for relocation. But for coming up with the sharing protocols that we'll need for entrance of unlicensed systems in a band, those funds were not provided under the law. So just one point of clarity there.

Now the other part that was in here was the recommendation about creating a spectrum innovation fund, that I know that has been discussed at times, but at this point the administration hasn't taken any position on that. And there certainly is no funding for it in the current budget plan. So that's

where that stands.

The last theory deals with a set of -- series of recommendations on unlicensed. And I think the biggest issue we had here was the recommendation to create a long-term national spectrum technology roadmap. And, to be honest, as I said, I'm not sure I really understand what that is in this case. So I think we would need more specificity as to what people are expecting us to put together.

We do have a number of activities within White House groups looking at sharing activities. Ones within this wireless spectrum research-and-development senior steering group. There's another group call PCAST, which I don't remember the actual, the formal name for that. But that -- those discussions are also going on. So I think we're moving that forward. The administration certainly focused on that.

And then also we are including in our 500 MHz search we are going to include

looking for unlicensed opportunities for unlicensed uses. I do not like the term unlicensed bands because I think that's not really in accordance with what we end up with.

So I think the biggest issue here, and maybe Michael can help us with this in the months for the next meeting, is some better idea of what a national spectrum technology roadmap would be, what would that entail. And I think it would certainly be helpful in doing that, once again, to give a sense of how much you would expect that to cost for us to put together that effort.

Now they also recommended that we identify a couple bands for unlicensed access. And we've got in the law two bands suggested. So our only other question then to the Committee: Is there other bands beyond those that you would suggest, because they're the ones at this point we're going to focus on in the 5 GHz range.

And then the fourth recommendation

about opening unlicensed access to new bands whether on a secondary or a primary basis, which once again in normal spectrum management parlance, they are not terms that we use. They hold neither a secondary nor a primary status. So once again I think we've got to at least use the terminology that's consistent to us, but in this case we are looking for how technical rules would, in fact, support this last recommendation to reserve flexibility in bands in terms of access, and so on.

The PCAST -- thank you, Brian -- stands for President's Council of Advisors on Science and Technology. And, in fact, one of our members, Mr. Roberson I believe, is involved in that.

CO-CHAIR ROSSTON: Well, we have --

MR. STRICKLING: Mark here.

CO-CHAIR ROSSTON: Mark's here.

MR. NEBBIA: Okay. Yes, Mark's here, who was also running the group. So you

may get a chance to ask him at the close here what all's involved with that activity.

So that's my quick run through on where we stand. And we will be getting back to the interference and dynamic access recommendations in time for our next meeting. We just didn't have time to get into that.

So I think we have a good set of recommendations. Some clarification, we're looking for. And be moving ahead.

CO-CHAIR ROSSTON: Great. Thanks, Karl.

So what we want to do is go through their different reports. And to the extent there were more questions, what I recommended to the different, we had talked to the different co-chairs of the Subcommittees was that to have reactions to Karl's reactions to the reports, so that there will be time in these reports to have a discussion back and forth with Karl and Larry about -- about those. But we should move now to the

different committee reports, and we notice we have -- even though the first search for 500 MHZ has dominated the discussion at the last couple of meetings, this time we only have ten minutes because they sort of have been on hold waiting for the reports. So I'll turn it over to Gary and Karl.

MR. STRICKLING: Karl's going to start.

THE SEARCH for 500 MHZ SUBCOMMITTEE'S REPORT

MR. POVELITES: This is Karl Povelites. Hopefully you can hear me.

Again, we continue to look forward to the release of the 1755-1850 band report. And, perhaps to Larry's point, maybe what we can do is offer some speed-reading courses for other departments, so that we can get that report out.

Subsequent to last CSMAC meetings, we got -- we had the recommendations approved by the CSMAC. We then tried to figure out what our next question that we were going to

answer was. And, in discussions that Gary and I had with NTIA, we were told to really, not to focus on anything until the report was offered. So --

PHONE PARTICIPANT: Could you move closer to the microphone? It's very difficult to hear you from the other end of the phone.

MR. POVELITES: I'll try to get closer. Is it on?

CO-CHAIR FONTES: Yes, but it may be just the phone line.

DR. KAHN: Well, there's two different sets of mic.

CO-CHAIR ROSSTON: Is there a phone link down there?

MR. POVELITES: Is there a phone link here?

CO-CHAIR ROSSTON: The closest one is by Gary, I think.

PHONE PARTICIPANT: It's been terrific up until this.

MR. POVELITES: I'll try to yell.

That won't go. Well, I'll turn it over to Gary real quickly.

But, again, we're looking forward to the report. We would like to discuss and find out from NTIA what questions they would like us to address next. I know that there are some thoughts that Karl had about what we could focus on. Again, the 1755-1850 band is extremely important, and we'd like to move forward with that. However we can help NTIA in moving that forward, we'd be happy to do. We look forward to working on that.

Gary.

MR. EPSTEIN: I don't have very much to add. We, of course, voted on the report last time. And appended to it are Janice's separate statement which call refer to. And then we apologize again to Jennifer Warren, but we want to make sure the public record identifies Jennifer as having concurred in Janice's recommendation.

And, as Karl said, we met both

with the NTIA folks and with our own Committee, and are ready, willing, and able to take the next step and await guidance from you, but clearly understand it doesn't make any sense until the 1755 report is out.

The kind of things that you could ask us to do really have to do both with procedural and substantive aspects of going forward with the sharing type criteria and the procedural aspects of it. So we are ready, willing and able to do that.

CO-CHAIR ROSSTON: Are there other comments? I guess Karl wants to address this. But are there people on the phone who would like to pitch in or -

Okay. Go ahead, Karl.

MR. NEBBIA: Yes. One of the things or what we had, in fact, asked the group as a follow-up question was the idea of providing input on the kind of industry-government mechanism that we might use in order to bring the various parties together to

discuss moving forward.

And because we didn't have the outcome of the report, there was a limited amount we could really discuss on that. I do note that the Sharing Group, however, has pushed that issue a little bit further forward and described different components of what might be needed in that type of activity, and made reference to our work on the 5 GHz wifi issue and how we progress that in the past. There was interestingly enough done under state departments' ITEU radio preparations.

So there is a little bit of an expansion in the sharing study. So I guess part of my thinking at this point. And specifically looking at the fact that we've been asked to put together these transition review panel as part of under the law. And that would apply to any future move that we do. It's not specifically focused on the 1755 band, but could be applied to other bands that we either have already kind of put on the

table or will put on the table in the future.

So I guess a question that may be a useful one to ask is certainly based on the experience the industry had in the first move, 1710-1755: What kind of information do they think, do you think that the bidder should have upfront that they did not have last time?

And, secondly: What should the nature of one of these transition plans be?

Because last time we asked agencies for a transition plan. In some cases an agency said, 'Well, I have a nationwide system. I'll be out of the band in three years.' That was it. That was the full definition of the transition plan.

What was of more interest to specific companies as far as I could tell was when they wanted to begin moving in the band they wanted to know for that nationwide system with cities were you vacating first.

So I think it would be useful for us to say, okay, how can we better define

those transition plans for particularly like nationwide mobile systems, which we know are in that band; for specific-location systems, whether it's telemetry, or whatever, or airborne systems. What would be the nature of a transition plan that's got a medium.

Because one thing I hate to try to do is say, okay, I've got a very general order. I'm going to go off and put all this stuff together only to find out that what I put together didn't really meet what people were looking for anyway.

Now I do want -- I do want to caution in doing that if we, for instance, say, well, a location-transition plan aspect is what's really critical. They want to know when you're getting out of certain places. I just I think it's important to acknowledge that once the agency lays out that location-based transition information, says, 'Well, I'm getting out of New York in five years,' if your company's intent was to get into New York

in the first year, you'll actually have a marker down from their cite saying, 'This is what we told you.'

Whereas when it was not specified, then it got into a negotiation between the agency and the company. And, ultimately, I think they worked it out. So I think we need input on what the nature of that should be. And we certainly don't want to get into a situation where by cementing in the transition plans, that we in the end prevent the companies from implementing. So I'll let you --

MR. STRICKLING: Karl, to that end, is this a new work stream you want to start here in which --

MR. NEBBIA: So this is a new -- I think --

MR. POVELITES: -- Committee would take it? I mean, understand, we have to do a rulemaking to create these panels. I think we have -- do we have six months to conclude the

rulemaking. But in your all's role as a FACA advising us, it would certainly be useful to get input on these and other issues related to that. I'm not sure which Subcommittee would take on the task.

MR. NEBBIA: I think the 500 -- I mean the 500 MHZ Subcommittee is the one that's about this process. So that's -- I think they would be, at least it seemed to me. But it's up to you guys how you want to assign it. But I think there are questions that we're going to need answered as we move forward, because we're going to want to structure in any band we do the information so that it supports the bidding process as much as we can. We realize there's going to be classified data, there's going to be stuff that people can't see. But then this issue about the transition plans and defining what that will be, so.

MR. STRICKLING: But I think the other thing people need to keep in mind is

that we expect for 1755 it's going to be done a little differently than it was done for 1710 in the sense that these consultations that we see happening right out of the gate probably go a long way toward resolving a lot of the issues and providing the information people are going to need to come up with a final approach to how we're going to deal with the portions of that band.

So in some respects I think the technical review panel and the appeal board are like solving the last problems we had in 1710. And we can actually probably come up with a process with 1755 going forward that may be will alleviate the need, the effort to have the invocation of that more formal process. At least that would be my hope.

So I think, you know, we need to keep that in mind in terms of this rulemaking we have to conduct, which will be everybody will be wanting to use the 1710 experience as the basis for detailing what the technical

review panel ought to do, yet when you actually look at what I think we're going to need to do on 1755, the old way, just I'm not sure is even going to be applicable.

MR. EPSTEIN: Just following up on Larry's point, --

CO-CHAIR ROSSTON: Gary.

MR. EPSTEIN: -- one of the things that made the first round really successful and we really appreciate it is you assigned specific questions to specific groups, and we could give you answers instead of just guessing.

And so here what I'm hearing a little bit vague still. Number one, do we wait for the 1755 report to do something.

Number two, I too saw that there was good work done in another committee but on this issue. So, you know, we should figure out collectively who should do this.

And number three is let's be real specific on what you want us to focus on

because we'll give you better work that way.

MR. NEBBIA: I'm sorry.

CO-CHAIR ROSSTON: Larry Adler.

MR. ADLER: Yes. Just on that point, I think that one of the points of clarity is the Sharing Group was focused on a process to ultimately facilitate sharing versus ultimately facilitate transition. So there may be some differences there.

CO-CHAIR ROSSTON: Jennifer Warren.

MS. WARREN: Thank you. I guess a couple questions. One is even though I understand why it was directed to the 500 MHZ Group, I think if you're talking about a transition plan that's not specific to that band, there will be perhaps a different set of interested members. And I'm not sure that, you know, that necessarily is a logical flow-on. But then I would also ask --

MR. EPSTEIN: We welcome expansion.

MS. WARREN: Excuse me?

MR. EPSTEIN: We welcome additional --

MS. WARREN: Yes. Not focused on the 500 Meg. You know, on that.

But the other question is, it seems to me, Karl, and you're asking for feedback on transition plans, that it may be nuanced differences if we're talking about vacating spectrum or sharing spectrum. And there should be perhaps some parallels but then also some differences that you would like to see in those two different scenarios.

Would that be correct?

MR. NEBBIA: Well, certainly by our experience any transition is going to involve some level of sharing. People are going to be wanting to know how close they can get to the incumbents as they're, you know, going out the door.

So in that aspect they're very closely linked together, but in general I

think you think in terms of transition plans for the incumbent you're thinking of them moving, as opposed to when we're talking about creating a sharing environment, you're not necessarily thinking about the incumbent group changing what they're doing. You're thinking about how people work their way in around the existing group.

MS. WARREN: I guess -- if I could follow up?

CO-CHAIR ROSSTON: Yes, go ahead.

MS. WARREN: I think what I was thinking of where you may have consolidation, so you may not have as wide spread a government use in a band, but there may be consolidation of government operations. And so they haven't -- they've moved from some parts, but they're still sharing a required writ large, instead to me there may be -- I haven't thought this through yet, but to me there may be some questions with respect to that that would be very different from a

wholesale relocation. I just want to flag that for whatever group gets the questions. Thank you.

MR. NEBBIA: It seemed to me as we have a group looking at the goal of 500 MHZ is, in fact, to provide for wireless broadband, there is a transition involved there. At least to me it seemed logical. Whereas sharing can be done. And I mean completely outside of once we meet our ten-year goal, sharing still is an issue, whether we're in the middle of that kind of activity or not, but -- and so.

MR. POVELITES: This is Karl. I think we'd like to take that on. We'll make sure that we're not overstepping or doing something that one of the other groups is doing so that there's no redundancy in working with a sharing team, just to make sure that -- because I see it somewhat as Jennifer does, is there's probably a transition from -- is it -- it's a compendium where you have sharing maybe

upfront, but the transition is from sharing then to exclusive use perhaps. So there may be some overlap there, but we'll be happy to work with Larry and his team to make sure we're not being redundant.

CO-CHAIR ROSSTON: Mark.

MR. GIBSON: Yes. I think there's also a data component to the transition plan because, you know, as evidenced by the way it went last time, the first effort was to get more data beyond what was released. So while I don't want to make any more work for our subgroup, I think we could at least inform one way or the other the data elements necessary and the process, how to improve the process for making that data available.

CO-CHAIR ROSSTON: Okay. That's a great transition to spectrum sharing.

CO-CHAIR FONTES: Perfect. Our next group, and actually I think in listening to what Karl's presented, and certainly with the willingness of the 500 MHZ Group to work

with the Sharing Group on trying to address some of these questions, perhaps help Karl refine the questions to be asked, and then to have some type of a coordination working between these two groups may be the answer in trying to address those questions.

Now I'd like to turn it over to Larry and Mark.

MR. ADLER: Mark's on the phone.

CO-CHAIR FONTES: Okay, good. Turn it over to you.

SPECTRUM SHARING SUBCOMMITTEE'S REPORT

MR. ADLER: Great. Excuse me. So again we're the Sharing Subcommittee, and we were looking at two questions this time.

First, I'd like to thank everyone who participated in the Sharing Committee. It was actually, I felt like, a very health and diverse group of people. And I really enjoyed working with everyone this past quarter.

So the two questions we were looking at was, first, this issue of systems

evolving. How do you deal with sharing where the primary service may continue to evolve. And then the second question was kind of the more general question, which is: What kind of sharing is really workable in the long term, and with in the back of our minds thinking about would part of this 500 MHZ be shared, a shared resource.

We ended up splitting the work into two threads. One was technical in nature and the other was more process in nature. So if you look at what is slide 2, the technical update, I'll walk through, but I'll ask Mark to jump in in a minute.

Mark McHenry really took a leadership role here and worked through a number of analyses looking at this first question. And we reported some of these last time.

But the question of how do you deal with the use change cases of the incumbent, the conclusion that was drawn from

the report, and you can see it is: Depending on the scenarios, there's a number of ways to do it, but there's kind of no one size fits all.

There are databases, there is sensing, there's a number of approaches. And depending on the scenario and the types of movement that you would expect from the incumbent, be it a way for change, the geographic movement, there was lots of different ways that that could be handled. And we didn't list them all here, but there is a report.

We also looked at an isolation analysis, which was what if you just did something very simple and just said we're going to isolate people geographically. And that turns out to be inefficient. That's the big conclusion.

So there's definitely a motivation to want to do more sophisticated sharing, and I think everyone here knows that. In order to

really promote efficiencies, you want to do something more sophisticated than just isolation zones.

In terms of sharing approaches, the group laid out a number of sharing approaches in the documents, again database type, geographic-sharing approaches, time based, sensing based. There really is no one-size-fits-all. And I think it's an obvious conclusion but an important conclusion, and probably one that this Committee should not spend a lot of cycles hoping someone's going to come in with this one-size-fits-all umbrella approach to sharing. Things have to be done much more on a band-by-band basis with detail technical information.

So with those kinds of observations and background material, we developed some conclusions, which are on the next page on the Technical Recommendations.

I'm going to let Mark, if you're on the phone, walk through the first

recommendations, the first couple, which were really around the information that would be needed in order to do this band-by-band stuff.

Mark, do you want to walk through those?

DR. MCHENRY: Yes, I'm here.

So the first recommendation is that there are so many parameters involved and there are no hard requirements from NTIA. We're told we don't want to provide -- we can't provide position, we can't provide frequency mapping. And they want to have unlimited change in case they want to change their operations. There are so many things they would like, we can't get started to design a specific sharing approach.

So I think NTIA should make a memo or a document outlining in general what the requirements are in terms of enforcement and what information they'll provide and then specifics. That would be the first step in getting a more concrete sharing approach.

And the second recommendation -- back to the first. This should kind of be done in the opening, because a lot of these requirements are on the entrant as well as the incumbent. If the incumbent. If the incumbent has a bunch of requirements that drive the spectrum use to zero, the entrant won't like it, and we won't get anywhere. And the entrant has their requirements. It's got to become an open process back and forth to develop these requirements.

The second requirement is every scenario, every approach has to have a data-based enforcement approach. The entrants need to register their position. And if something goes wrong, the incumbents have the right to turn the entrants off or to adjust them. Every approach we've seen has that. And every incumbent we've talked to says they want this feature. This is the one feature that fits all the approaches.

And the third approach is what

Larry just said. Don't pick one now, don't necessarily pick database or sensing. It's so much better to tailor them for the exact situation.

You can show that if you pick the wrong approach, you can get horrendous exclusion zones and it's unworkable. And adding the right mix of channel-selection algorithms will get you a little more spectrum, and it doesn't really hurt the incumbent that much.

So that's the three technical recommendations so far.

MR. ADLER: Yes. I thought that, Karl, you'd appreciate the third recommendation has a low-cost implementation.

(Laughter.)

CO-CHAIR FONTES: Do you want to comment, Karl?

MR. NEBBIA: Yes, just a couple thoughts. First of all, I thought that, at least for me reading this, the most

significant response in this is that in the world of sharing and proposed sharing in the future, that the incumbents are not -- they don't have their own protected world anymore. And I think that is really significant. Because as we have written radio regs, whether internationally or domestically over the years, the word "secondary" meant the primary could do whatever they wanted and secondary had to live with whatever that group became.

And recently in the international rules, primarily, but I'm not sure there are cases where the FCC's played with this a little bit on the domestic rules, when a new entrant has come into a band, they've specifically written into a footnote that the new entrant will not interfere with the existing and will not, in any way, hinder development of the existing user.

So for us at this point to say that in creating future sharing arrangements, the incumbents are going to be limited is

significant, I mean very significant. In fact, I can hear, I can feel the shaking of the ground throughout that incumbent world. That's a big, big issue, because they want to continue to develop their business as much as the entrant wants to develop their own.

And, in fact, as we -- you know, we get into hear to some of the questions and the actual text aside from the PowerPoint stuff makes it look like the entrant is getting some sort of guaranteed access, which is even a further step, maybe not, you know, viewed by others in the past.

So I do think that that is a really significant step that we have to be aware of as we move forward, that once you begin to enter into these arrangements there are going to be limitations on the incumbent as to what they can do in their talking modifications in the future.

DR. KAHN: But realistically, right, --

MR. NEBBIA: This is Kevin.

DR. KAHN: I'm sorry. This is Kevin.

MR. NEBBIA: On the microphone, please.

DR. KAHN: I'm sorry. Did it again.

Realistically, I mean if the sharing is going to be a value rather than just being, you know, kind of a headline item that feels good and never is taken advantage of, some amount of that kind of compromise is going to have to be there, right, because you're talking about asking a new entrant to come in and make a sizable investment of some sort in utilizing this band. And, you know, if the answer is but tomorrow the guy who was there already could do absolutely anything he wants and your investment goes to zero, that's not the kind of environment that's going to generate any real use of the sharing, other than perhaps, you know, the unlicensed guys.

And they are -- you know, in the unlicensed things we've talking about, some of the issues as well.

So I think it's almost inevitable that some degree of what you're talking about is going to have to happen if we're serious about sharing.

CO-CHAIR FONTES: Let's go with Jennifer, then Rick, and then we'll come back.

MS. WARREN: Jennifer Warren. I think Kevin's point's a really good one, but I think it's also one that is a two -- sorry -- is a two-way point, which is the investment that's needed.

I mean, first of all, this conversation assumes incumbents are not the commercial carriers. Even the first note in the motivations for the process recommendation assumes that, but that may not be the case. But let's just go with that assumption.

There may be significant investment required by manufacturers for

federal systems, for example, that if that product isn't able to continued to be used and/or sole more broadly than one time or evolve, that's a problem from an investment perspective as well. Because I know we tend not to think about this, but there is an entire industrial base that does R and D, development, product manufacturing, commercial companies with shareholders that have the same investment approach to business.

And so we have to think about what does that mean for the investment and R and D needed to develop the new systems, to continue to be able to evolve from both sides, not just the commercial side, quote commercial side.

Thank you.

CO-CHAIR FONTES: Rick.

MR. REASER: I guess the logical thing about all this, so if the objective is to maximize the amount of sharing that you're trying to do, the incumbent's going to have to some give. I mean if you're really trying to

share, really share at the maximum extent, then both parties have to be able to negotiate.

And so I think that -- I know that the ITU says all those things and all that, but basically the secondary -- it's like you said, the secondary thing is really not sharing. That's sort of on an as-available basis kind of a sharing, which is not really sharing.

So I think if you're going to head in that direction, both sides are going to have to give a little.

CO-CHAIR FONTES: Larry.

MR. ADLER: Yes. I just wanted to point out that, Karl, you're very perceptive in actually reading the details, that the point that was in there was that we think there's ample room, the hypothesis that's backed up by some of the analysis, that you can't have infinite freedom as the incumbent, but you can have a pretty large amount of

freedom to do what you need to do. But you have to give up something in order for the new entrant to get some assurances. Of this the incumbent has infinite freedom, then it's very, very hard.

So the point is we think that there is a big space of opportunity for mutual benefit. And I want to make sure you...

MR. EPSTEIN: It's Gary Epstein again.

Reading this very good material, there are two themes which really come through to me. One of the them is the one we're just discussing. And there's a lot of experience in this room, but no matter how many footnotes or sub-footnotes or double sub-footnotes you put and say somebody's secondary, you wind up with a fight ten years down the road about whether or not they're really secondary. It's just inevitable because people have made investments there. And if this is a recognition of that point, well, it's true.

It's just to say anything else doesn't work.

And the second theme I saw in this report and other report is maybe the ultimately answer to this, and you never really get anywhere, is to move to a world where you have the internet of things, where things call home. And you are able to handle it in that situation. But that raises a very interesting regulatory and economic question, and that is: Do you want to somehow require that devices have that capability in it, or do you want to have cheaper devices that are out there that the marketplace wants but are much less susceptible of being able to resolve sharing problems. I think that is -- the problem may not be an issue for this group, but I think it's an issue that's really out there.

CO-CHAIR ROSSTON: By the way, that got picked up quite a bit.

DR. KAHN: Yes, I do. I do.

CO-CHAIR FONTES: All right.

Shall we keep going?

MR. NEBBIA: I'd just like to make, I guess, another point related here. One of the issues that always comes up in the federal use of the spectrum is that the time component or intensity component of that use is generally considered to be light, certainly compared with a cell phone type environment.

At the same time more and more the cell phone equipment is being built to operate over multiple bands, have different channel selection, and so on. So I thought one of the things that just really didn't draw attention to that may be part of the solution is that it's one thing to say, 'We're going to come up with an arrangement that separates us geographically,' and that's one aspect of sharing. It's another thing that says, 'Well, you're going to have these characteristics and my sensing is going to recognize those characteristics and we're going to recognize this band.'

But there's another aspect that just says you're only going to be on about one percent of the time or maybe point five percent of the time, and therefore I -- and because I have a multiband operation, that I'm just going to live with the reality that when you come up on that point five percent of the time, I've been given more spectrum to operate in during that brief period of time, I'm just going to live with less spectrum, that it doesn't take a specific arrangement. It's just takes a willingness to recognize that, yes, I'm going to lose a component of what I have for brief periods of time. But if that's what enables us to make better use of the spectrum, then that may be an answer in and of itself.

CO-CHAIR FONTES: Okay. Larry, do you want to continue on so we can kind of work to get back on our schedule?

MR. ADLER: Yes. I have till 10:20 on this.

So the next element was we looked at process. So, as we said in the first technical recommendations, having a general solution was probably fool's gold, and things needed to be much more band-specific.

As we looked at the process, there was another insight that I think really emerged, a few insights that emerged in the discussion, and I talked about this last time. But it's really the insight of the people to be willing to participate in the process.

You do have contingencies, and I don't want -- I'm not speaking ill about, but this is just kind of the facts, is that there's -- most contingencies want a cleared spectrum. That's their preferred outcome. They would like all the spectrum to be clear for their use.

And so when you think of a negotiating position, that's their starting position. And anything that compromises that position is difficult for them to engage in

that discussion.

So one of the insights in the process that you will see is you need something that people feel like, you know, this is going to happen, this is going to be shared, I need to participate in good faith to figure out the technical parameters to make it happen. Otherwise, you end up with a stalemate.

So the process has to have some heft. It has to have some senior oversight, and so forth. That was one of the things I wanted to call out on this.

And there's also technical complexity. You need to have the right number of technical experts in the room. It's not a lawyer thing. There's room for the legal part of it, but you need deep technical experts, people like Mark McHenry, et cetera, that can really get into the details.

And also the timing of the process is important. As we go through the

recommendation you will see that we had a lot of discussion. And I'm not an expert here, but apparently once you get to public notice and comment, agencies can't participate. And so this is a problem that needs to be addressed. You need a process where you can have good, good participation, collaboration, and then of course followed by the actual rulemaking itself.

So with that we'll turn to the process recommendation. So, Steve Sharky, are you on the phone?

MR. SHARKY: I am, yes.

DR. MCHENRY: So Steve drove a lot of this work.

So, Steve, you want to work through -- walk us through this?

MR. SHARKY: Yes. I'm sorry. I don't have the paper in front of me, so, Larry, I mean I think you're pretty familiar with it. Do you --

MR. ADLER: I'm happy to do it,

sure.

MR. SHARKY: Okay. Thanks.

MR. ADLER: Yes. I just want to acknowledge that Steve did put a lot of -- a lot of work in it. So very similar to the recommendation that the 500 MHZ Subcommittee made, this recommendation is a little bit more focused around sharing and has a number of aspects.

First, there just needs to be dialogue between the incumbents and the new entrants to develop a specific recommendation. I'm not going to read the text, but I'm going to highlight a few things.

The discussion needs to take place between the experts. Got to have the experts in the room. As I just mentioned, that's very important. Again, we don't have let's develop the beat-all, end-all sharing for the entire band and entire globe. It needs to be focused on a band and specific issues. It needs to be early in the process so that you can have

participation of agencies, and so forth.

It needs to have the senior oversight that we discussed, I discussed a second ago, which gives it credibility that people actually participate in good faith in the process.

And of course at the end of the day the expectation is this would go through the official notice process. This would just be something in addition, a supporting activity to get the technical things going.

So that's the basis of it. There's lots of -- Rick, and provide a lot of expertise on how this might happen, some of the downfalls of the FACA process, and there's a lot more detail. But this recommendation tries to capture the high-level points of what we want it to do.

MR. NEBBIA: Can I just make one quick point?

The one part that I think confused me, and maybe it's just a matter of how it's

written, is in the middle of that Process Recommendation, it says, "The discussions should be open to any interested parties," which I think is not a problem, "but must be focused on a limited near of issues or scenarios to develop actionable recommendations [which] would be codified as appropriate..." So I think it's got to be written in a way that it's clear that that ultimately is the end goal, but if looks like those discussions are directing that outcome, we're going to -- the lawyers are going to tell us you've created your own FACA, it has to fall under those rules, and so on.

So and maybe it's just a matter of how it's separated in the wording of the text, but if an informal group like that is aimed at giving consensus recommendations, that's what sells -- sets the bells of.

MR. ADLER: So maybe the wording of recommendations, that particular language, we need to take a pass on the edits there.

CO-CHAIR FONTES: Kevin.

DR. KAHN: Yes. This is specifically why earlier I was raising this issue, that on the industry side the discussions that are beginning to happen in places, whether it's ATCE or 3GPP, or some of these other industry-oriented bodies, to try to define interfaces that would be used to query about spectrum's availability, how it's going to be used, et cetera. That stuff's gearing up. And I mean it's being driven by people like Qualcomm and got some Intel people in it, but I mean the typical players that you'd expect to supply equipment into that space.

Now, you know, that work's going to go on. And they're going to come up with standards. You know, whether these standards are meaningful or not is a different question. But if we kind of, from the kind of government side of this, kind of ignore that process and don't -- I mean I know Charley said, you know,

we'll monitor the output, but what I'm worried about is that by the time the output shows up, we're sort of asking for the next problem in front of us if that output is not compatible with all the thinking that's going on inside the government side of this.

And I would sure as hell like to find a way, even at an informal level, for there to be more participation by the government side, both the U.S. and elsewhere in the world, in those deliberations so that the stuff that comes out of that is meaningful and useful, you know, for everybody.

So I really encourage you to look at what's starting to bubble there and find, you know, legal ways to engage it at whatever level you can afford to. I mean I understand that like everything else we're talking dollars and money, but the alternative seems to me to be one that's kind of really spooky, because you'll get some standard written by this set of companies that may be a wonderful

standard, but meanwhile, you know, government thinking has gone in some other direction and we're back where we started.

MR. EPSTEIN: In order not to reinvent the wheel, I wonder whether a lot of these issues have recently been thought about in Dale Hatfield's VTAC-type committee and whether or not there's any learning. A different level of specificity or not.

CO-CHAIR ROSSTON: Get the microphone down. Yes.

MR. HATFIELD: VTAC's been fairly quiet because I particularly was concerned that we not get ahead of ourselves, that we not talk too much about what we've accomplished until we had accomplished something. And I think I'm getting to the stage now, we are just finishing up our second major report and getting ready to engage on a third one. And I'm feeling confident enough now that I think some of our experience in the multi-stakeholder world now would probably be

-- probably would be useful.

CO-CHAIR FONTES: Jennifer.

MS. WARREN: Sorry for the noise. Jennifer Warren.

I want to pick up on the point that Kevin made, because I think it's really important, is that by the time those groups do come out with standards, it's too late. And there does not to be an informal way, that I would suggest is not really just the government users that are really relevant to this discussion that aren't there, but also the manufacturers of the relevant equipment and designers and developers of the relevant equipment that the governments buy.

And one of the things that was useful in the 5 GHz process was that there were actually radar engineers at the table that were from the companies developing the radars, as opposed to the government users, who were more setting requirements, performance requirements, et cetera, but may

not realize the full range of options that there are, because that's not part of a contract. That's not part of what their mission is.

So, you know, informal discussion between and among the wireless manufacturers and the, again, system manufacturers for the other types of systems, whether it's air traffic control or foliage-penetration radars, or aviation radars, whatever they are, that would be very beneficial I think, because after the fact it's too late.

And also in the 5 GHz context, while they were looking at what was in place, I think one of the things that was very useful was there was a lot of ongoing development for next-gen radars, and that was able to be factored in.

So, again, that may not be familiar to the user that's sitting at the table because they're not part of the acquisition community or they're not, you

know, part of that program office.

So there's a lot of value to broadening this, but, I'll tell you, I think a lot of the manufacturers aren't going to go a 3BP, whatever, and sit there, because that's not directly relevant to a product that's being developed by them. And I just think there's room for further dialogue that does not happen.

DR. KAHN: I mean maybe there's a role for NTIA or NTIA plus FCC to convene a few workshops, you know, and invite the relevant commercial providers of both sets of systems with some of the government people and create a forum just to get some of the relationship discussions going.

MS. WARREN: Because I think then you can't -- sorry, Jennifer again. I think then you have to -- again, because some of our technical characteristics of equipment, we have to get -- we would have to get export licenses if we were have to certain

conversations in open forum, because they're open to the world.

So I know that seems kind of odd and burdensome, but having informal dialogues with U.S. players would be, you know, a starting point.

DR. RUSH: This is Charley Rush on the phone here. You know I think you have to appreciate that standards-development organizations like the 3GPP typically are industry as well as being industry driven. And while I'm not -- I don't know the details of the observer status, but I would guess that perhaps governments could at least attend meetings without maybe having a major participation.

The work that's undertaken within those standards-development organizations are not as cavalier as perhaps some may believe or at least express, in that a lot of what goes on within the 3GPP, for example, is work that is the result of vendors or operators bringing

ideas or proposals to the organization to undertake to develop a standard or an application that they firmly believe they have an opportunity to have implanted within a specific region of the world or within specific countries and consistent with what the regulator has indicated he or she would like to see.

So it's not just sitting around saying, 'Okay, well, today I think this and we'll go ahead and develop this,' and then the dead will take the hindmost, and you have to take it or leave it. It doesn't quite work that way.

MR. ADLER: All right. So I'm going to wrap up. I'm going to go on then to the next steps or next topics slide.

So the group had a discussion about what might be the next topics. We looked at the original questions. The group has kind of felt that we've done what we could on the two questions listed here in kind of

the abstract setting. And we looked at some of the other questions around test bed, which is a possible next topic, if that was of interest.

Also we felt that Question C would need to be band-specific, I mean more specific than it's currently stated in terms of what could be realistic in terms of sharing acceptable interference.

Again, the Question E also would be more specific.

So the types of topics we think the group could take on is focus on specific band, a sharing scenario. Mark's going to do a more detailed analysis and produce, you know, something on a specific band.

Looking at specifics technologies, like sharing with a specific entrant, radar, or a specific incumbent, we could do that. We could do more of a survey of technology-sharing approaches or we could work with a specific industry segment, utility has been

brought up, commercial cellular, unlicensed. But those are some of the ideas. I think this is really a discussion topic that I'd throw out there, is where would you like the group to focus on next. We don't have to necessarily settle it this meeting, but I think the group is feeling like we're ready for another question.

CO-CHAIR FONTES: Karl.

MR. NEBBIA: Well, certainly one of the ones that I think is being touched on in a number of places that I think would be really helpful and it's kind of a buzzword that is out there right now, is what in fact we could use in terms of a test bed. What that actually means to people. I mean that's certainly something we're going to be looking at in the months ahead. And I think it would be really helpful to get feedback on that issue, what that entails.

When the first idea came up a number of years ago, I was in a meeting where

everybody nodded their head. And then after the meeting was over, they all went back and said, 'What is a test bed? Is that a band? Is that a place? Is that a method?' What exactly do we think in terms of a test bed is valuable. And certainly the Commission had a rulemaking or NOI I guess on experimental licensing not that long ago, and that sort of thing. So it would be really helpful to get some views back on what the test bed really would entail.

MR. ADLER: All right. Without speaking for the whole group, I think we'll look to take that on, and I'll get back to you after conferring.

CO-CHAIR FONTES: Great. Are there any other comments, Larry, from your group?

MR. ADLER: Any other comments from the members of the Committee who are helping?

CO-CHAIR FONTES: Any comments

from any individuals on the phone? Great. Thank you, Larry, Mark.

CO-CHAIR ROSSTON: Great. So now we're going to turn to the Unlicensed Spectrum Subcommittee Report. And for the people on the phone this is going to be more pleasurable because Michael Calabrese is on the phone, so you should all be able to hear him very easily given his nice, strong, clear voice.

So, Michael, I hope you're still on the phone.

Michael, you may be on mute.

Michael Calabrese?

CO-CHAIR FONTES: Going once. Going twice --

MR. CALABRESE: Hello?

MR. NEBBIA: How are you, Michael.

CO-CHAIR ROSSTON: There you are, Michael.

MR. CALABRESE: Oh, I'm sorry. I must have hit the mute instead of the unmute.

Yeah, I was just saying let me

know if I fall short of a strong, clear voice at some point.

CO-CHAIR ROSSTON: You did for a while, but now you're okay.

UNLICENSED SPECTRUM SUBCOMMITTEE'S REPORT

MR. CALABRESE: So apologies for doing this by phone, but we'll make the most of it. Janice Obuchowski co-chairs the Unlicensed Subcommittee and, unfortunately, is in Europe and could not participate. And of course I'd encourage others on the Subcommittee who are there in person to chime in at any point for further clarification.

So what I'll do is, I guess, run through our five recommendations. We're really at the point where this report could be adopted by the overall CSMAC if it chooses. The recommendations are really virtually the same as we reviewed in November. We've just made further enhancements and adjustments and added more material to the report itself.

So the questions that we have --

you know, we hope we've largely wrapped up on concern enforcement. So we were asked to look into how should federal agencies deal with interference, complaints from unlicensed users, how should federal agencies deal with interference that unlicensed users experience, since they don't understand the rules, how to deal with the risk of software modifications that might alter the compatibility characteristics of a device and make it -- cause it to interfere with federal systems, and what is the best approach to enforcing rules when the number of -- you know, with these widely distributed products that are kind of a horse-out-of-the-barn situation.

So I think what's an important framing is that we really -- our recommendations really distinguish between two very different types of unlicensed wireless operation. There are -- you know, for the most part today, there are untethered consumer Part 15 devices and systems that are typically

less expensive because they're unconnected and typically designed to operate on a single band.

Then there are, you know, coming along connected equipment that can be required to -- or are required, for example, in the case of the TV whitespace, to call home periodically, such as through a spectrum management databases to receive updates or to take mitigation steps when interference occurs.

So with that in mind, our first recommendation is that NTIA should put in place regulatory requirements in coordination with the FCC, which would primarily be through equipment certification that reduce reliance on post hoc regulatory enforcement of interference by relying on technology-based solutions for connected devices. And there, you know, our thought is that NTIA and FCC together should encourage the adoption of technologies that have been designed to

operate in a shared-spectrum environment and that can avoid noisy channels and interference through technology such as auto sensing and channel-management capability.

In other words, that they would be multi-frequency hopping and connected devices, which really leads straight into Recommendation Number 2, which is a little more specific on this, which is that we recommend that NTIA, again in coordination with FCC, require that an all new unlicensed band or in shared federal bands designated for unlicensed access, that devices should be connected devices that are required periodically to call home to renew the authorization to operate in the band, such as via a certified database, to obtain a firmware update, to be remotely disabled in a particular frequency, or perhaps receive direction to move off that frequency.

Under this scenario consumers would not face the burden of interference

mitigation, since this should all be automated. And the responsibility would lie more squarely on manufacturers and the equipment-certification process to build in the technology solutions.

We understand that these prophylactic technology solutions would increase the cost of devices at the margin, but we thought that's reasonable to impose conditions for unlicensed access, particularly incented a federal band considering the no cost or low cost of unlicensed access.

The report also describes I think more than it did in the November draft, in particular, the dynamic-database approach to device reauthorization and updates. And there's also an appendix, B, with a detailed example of how unlicensed device reauthorization via database could work. And Kevin contrasted that and could certainly talk more about that.

Recommendation Number 3 is that as

a fallback in cases where noncompliant devices are knowingly not operating within the rules or where avoidance-through-technology measures fail, NTIA should recommend that FCC strengthen enforcement measures to buy better deterrents. And that NTIA in coordination with FCC should also be educating policymakers concerning the secondary status of unlicensed devices and shared bands and their obligation to accept interference.

So along these lines what we essentially endorse again and list many of the recommendations on enforcement that were in the 2010 Enforcement Subcommittee Report. You know we didn't want to just reinvent that wheel, but we did reiterate ones that we thought were relevant.

Recommendation Number 4 is that in cases when it is not a matter of unlicensed devices intentionally operating outside the rules but interference nevertheless occurs, manufacturers should increase consumer

education efforts and that consumer awareness will continue to be an important counterpart or backstop to both enforce stronger enforcement and avoidance through technology efforts, although we certainly expect that the avoidance through technology would begin to be the most effective route.

And then finally, Recommendation Number 5, the Committee recommends further study of the current regulatory treatment of so-called cheap, dumb devices, in other words, untethered and particularly single-frequency devices, the Committee recommends, generally recommends that in the future such unconnected devices should be restricted to certain bands of spectrum where they are already prevalent, such as 2.4 GHz. Policymakers should consider whether such devices should be even further restricted in the future, phasing out their access to very high-quality bands over an appropriate time period. But we recognize that would require some further study and an

extensive transition.

And, as an example, we note that under this approach a deadline could be set by which time unconnected devices would be restricted to some appropriate band or multiple bands, but not allowed any longer in others, such as 900 MHz.

And then, finally, I won't go through these now, but I'll just note that at the end we have -- because I can come back to this if there's time -- we have possible questions for further study, to which I expect now we will add the couple questions that Karl raised when he went over the NTIA's response to the previous year's Unlicensed Subcommittee recommendation.

CO-CHAIR ROSSTON: Okay. Do we have discussion, comments on what Michael has said?

Did you want to, Karl? And then Dale after that.

MR. NEBBIA: I have a few. First

of all, the specific questions that we laid out are -- or were based upon the realities of today. And I appreciate the fact that Michael and the group has laid out some ideas about what we should do moving forward, but unfortunately we do have the reality of the situation today where agencies are being faced with interference cases where there is a public outcry about what's happening to them, even though they have no rights. We're still having some of the garage door processes ongoing, and so on.

So I think we still would like some responses as to, and it would be nice to have the Committees say what posturing they think that the federal agency should take under those circumstances. But I also note that the recommendations that we've been given, of course we've got to recognize that it's the FCC that controls the Part 15 rules. NTIA allows the use of federal -- by federal agencies of those devices, and we basically

tell them for the most part that they've got to comply with the Commission rules. So they're buying off-the-shelf, unlicensed equipment.

They do have a possibility of building some of their own. But, let's face it, the realities are buying the same off-the-shelf equipment that everybody else is.

So in reality it's the Commission has to make way in these rules and I see the clear message here that NTIA should make these recommendations toward the Commission, changing their rules to accept these limitations on the unlicensed community.

Now, Michael, you are certainly a person that is in a role of being representative of that community, and there may be others here also. So my question here is: If we were to do that, and the Commission were to say, okay, we will open up a rulemaking on this process, what kind of response are we going to get from the

unlicensed community with respect to these recommended restrictions?

Is this something that the community will buy into? And, Michael, from your knowledge of the community, is this something they would say, yes, this in the end is going to help us out?

And, in fact, with, for instance, the untethered devices, the dumb devices and so on, well, they don't cost very much, but I know right now we've got an issue going on in Annapolis at the mall that a lot of people are getting out to their cars and can't get their key mechanisms to work. And these are often in very expensive cars, so the fact that the key mechanism is inexpensive doesn't particularly matter. But magically of course those key fobs are in the same DOD band, not the same specific portion that the garage door openers are in, but they're also in a Defense Department band. So we're likely to see more of that kind of activity over time.

So I guess my big question here is: Will the industry get behind such an activity to limit their activity?

I mean I think it certainly solves problems if we do that. But so, Michael, what are your thoughts on that?

MR. CALABRESE: Yeah. I would -- I don't want to claim to speak for, well, either the entire Subcommittee or for the entire unlicensed community, obviously. But for my own perspective and experience, I think that would -- you know, that NTIA being and the federal government being clear about what protections it needs, you know what does it need in order to open sharing to particular bands would be very welcome.

So if you look at the TV whitespace experience, the terms of access to the vacant TV channels is really highly restrictive compared to what it is in 2.4 GHz for wifi and other traditional unlicensed uses. And although certainly many of us think

it's far more restrictive than it should be, I think -- you know, so, for example, users will pay a cost. There will be a transaction, some sort of fee that will go toward the database administration.

There's also the -- you know, devices certainly will be more expensive because of the need to periodically check the database. And even the power limits and so on are much lower, much less robust than they are in 2.4, and yet we call it super wifi, and folks are quite happy to have at it.

So I think as long as there's good faith and the federal users are not seeking kind of to ridiculously over protect, that it will be very welcome to simply you know what is it that we need to work around. In other words, what are the terms of use that would allow access to this unused capacity.

CO-CHAIR ROSSTON: Dale, did you want to make a remark?

DR. HATFIELD: I just wanted to

make a couple quick comments. I've been spending the last few weeks, it seemed like, almost totally immersed in the receiver-performance problem and not in the big one that's getting all the publicity, but in the general issue, I would hasten to add, the general issue receiver performance.

And it's not clear to me how you're addressing the receiver-performance problem in your draft recommendations, because, as we know, a lot of times interference arises not because anybody's doing anything wrong transmitter-wise, because you're getting inter-mod or something in the receiver. So I'm just sort of curious as to what you've thought about in terms of receiver performance and how your sort of remedies that you talk about work when it's a receiver performance problem.

The other thing that's been bothering me a little bit, and I don't want to sound like an apologist for the other parts of

the unlicensed, but I get confused not only with the use of "unlicensed" in the sense that Karl was talking about, but it tends to, I think, to me be a band where you can really innovate. You could do all these sort of things without asking permissions.

And here, what we're talking about here is nothing like that at all. It's very much about asking permissions and it probably very much has restrictions on what you can do in terms of your devices and stuff like that not to cause interference.

So it bothers me that there's -- it could be misleading if people think that a tethered sort of device with all these restrictions to prevent, for good reasons, interference is anything like we have today in that chaotic band, because I kind of like those chaotic bands for some forms of innovation, because you can just go do things without getting the government involved at all.

Anyway, those are just two comments: The receiver performance issue and what are we really creating or talking about creating here when it's nothing like today's chaotic wifi.

DR. KAHN: Well, could I comment to that? I think one of the things we need to be more careful about distinguishing is -- sorry.

CO-CHAIR ROSSTON: Just your name.

DR. KAHN: Kevin Kahn.

One of the things we need to be more careful about distinguishing is operation in so-called unlicensed bands, like 2.4 and, to some extent, the 5, although that's sort of in the middle a little bit, and this notion of allowing more unlicensed use of shared bands that are in other purposes. Because I think, you know, in particular things like the 2.4 band really are, as you say, pretty chaotic, you can pretty much do what you want. But there's nobody guaranteeing anything there.

I think a lot of this was more toward addressing if we were going to allow more unlicensed sharing or devices which are -- you know, licensed-by-rule devices that are allowed to operate in otherwise occupied bands based on something, you know, some sharing. What would be the requirement to allow you there.

So there's a good quid pro quo. Yeah, there are some additional restrictions. You're going to have to call in and you're going to have to be willing to turn yourself off until you get fixed if you turn out to be a bad actor, but what you get for that is you might get access to a whole ton of spectrum to do stuff in a well-behaved manner, right. So I think it's probably worth, and we ought -- we don't distinguish here it as well as we probably should, but we really should distinguish those two cases because they're actually quite different.

DR. HATFIELD: And the resulting

public benefits because you get some public benefits, but you also don't -- you lose this chaotic band which allows somebody in the garage to build some devices and go test them.

DR. KAHN: You're not going to lose it. It's still --

DR. HATFIELD: Yeah. Yeah. Well, --

DR. KAHN: It's not going anywhere.

DR. HATFIELD: Well, --

DR. KAHN: These rules are not as -- like that.

DR. HATFIELD: I'm beginning to sound like an advocate here, and I'm not. When we say that, though, there are people who make the case that we ought to have more chaotic bands.

DR. KAHN: Fair enough. And that's --

DR. HATFIELD: That's a very legitimate trade-off.

DR. KAHN: Yeah, that's a separate question.

DR. HATFIELD: The question of over -- over-constrained opportunity for people --

DR. KAHN: Yeah, that's a separate question -- which is should we --

DR. HATFIELD: Yeah.

DR. KAHN: -- designate some additional chaotic bands.

DR. HATFIELD: Yeah.

DR. KAHN: All right. But that's not really what this was addressing.

MR. CALABRESE: Yeah. And we began discussing that question about should there be, you know, additional designated bands for unlicensed, and we haven't gotten beyond sort of a listing of pros and cons. But, as Kevin said, this set of recommendations, you know, when we're talking about a requirement of connected devices, we're really -- what we're really thinking

about in particular is sharing with federal primaries, you know, in bands that will be occupied by primaries that need some form of protection or assurance.

DR. HATFIELD: I'll be quiet, but it's more than just being tethered. It probably means that you're going to be constrained somewhat in your modulation in some of those other things to be able to assure compatibility and so forth. So I have a hunch it's going to end up more than just you have to be tethered, but you have to be operating in certain ways in terms of your waveforms and things like that, perhaps.

DR. KAHN: Yeah, but that's true even in the 5 GHz, right, with the sharing arrangement with the radars, right. I mean so that --

DR. HATFIELD: Is that --

DR. KAHN: -- that almost goes without saying if surety --

DR. HATFIELD: Is that good or

bad, is what I'm --

CO-CHAIR ROSSTON: So, Mark.

MR. GIBSON: Yeah. I just want to go back to the point -- this is Mark Gibson -- the point, the question Karl asked of Michael five minutes or so ago, and that's the user community and, you know, with respect to how they're going to adopt this or embrace this.

And I don't think it's the user community, I think it's the manufacturers. Because I think if you look at the situation we have in whitespace, you've got unlicensed devices that have interference rights over other unlicensed devices by virtue of them being able to register in the database. A very complex process, that when you talk to the mic users they're not even sure how to do.

And, you know, I'm not going to sit here and have it on the public record that the mic guys are responsible for it, but all you got to do is read the press, so they've got to be at the table, I think, and it's not

-- in the end it's not the people using the mics -- and I notice these are wired -- it's got to be the manufacturers, because the people buy what the manufacturers sell.

So I put that to you, Michael. You know we need to kind of reach out to them at some point in this process.

CO-CHAIR ROSSTON: Harold.

DR. FURCHTGOTT-ROTH: Karl, again this is Harold Furchtgott-Roth, in answer to your question.

I think if NTIA makes a proposal to the Commission -- first of all, the Commission's going to take it very seriously. And it's NTIA almost on behalf of federal users, which I think begins to answer some of the issues that have been raised here at the table this morning.

The discussion in the Subcommittee was very much about unlicensed use within the context of federal bands, if you will. There was discussion, as Michael mentioned, about

should there be created a new band, and I don't think the Subcommittee was willing to reach a consensus on that.

But, Karl, I think if NTIA went and said this is something that we'd like to have the Commission address but primarily in the context of unlicensed use in federal bands, then I think that might give the context that the Commission would look at.

MR. NEBBIA: This is Karl.

That certainly would be a significant undertaking, because on many rulemakings the Commission does, we clearly respond in a case where they're doing something, we say, and what you're doing impacts federal users in such-and-such a way. For us to initiate a rulemaking on this, on behalf of the administration, and I think that's how it would be viewed, is basically for us to conclude upfront that we think industry should, in fact, make all these changes.

And for us to get onboard with taking the administration going forward and saying they think industry should do this or that is a little bit more significant than us responding on behalf of federal users in a normal rulemaking. So I think we certainly have to have that kind of internal policy discussion before we would press that very publicly.

But one other thing I just want to take note of in this process is that ultimately I think we have a process, whether it's through the chaotic bands or the other more organized bands, we have a set up here that really benefits an industry of people and certainly benefits U.S. consumer users, and so on.

And I think the structure that we've created, I think, makes the way for that. And if that structure doesn't work, we begin to cast doubt on it. We begin to cast -- you know, create issues for it.

And certainly on the garage door issue, I think the resolution or the real movement forward on that issue came partly by DOD being willing to talk with the manufacturers, but ultimately the manufacturers accepting their responsibility of going back to their customers. Whereas in the initial days of the problem they kept saying: It's DOD. Call your Congressman. And that was the manufacturers' approach. But once they finally came to a point of saying this is in all of our interests to make this work, this structure that we have, then they got onboard, I think, in the information process. And I think ultimately, as we lay out, well, the FCC and NTIA need to talk to Congressional people or need to make the public known, the industry that supports this really needs to play a huge role in that part. And if they come onboard and say, 'Well, here's how we solve this problem,' that's different from them saying, 'No, let's keep

pressing home with the political angle to get DOD off of the spectrum,' so.

CO-CHAIR ROSSTON: Jennifer.

MS. WARREN: Jennifer Warren.

Two questions. Actually one for Karl and then one for Michael.

Karl, I'm only familiar with one proceeding where NTIA has initiated a request for a change at the FCC. And it didn't really get -- I think it's been pending five to ten years, perhaps lack of industry engagement has been part of that. But other than that, which I encourage you to pursue, what -- are there other examples of where there has been, you know, successful action by the FCC at initiated rule-change requests?

And then my second question is to Michael.

Michael, in the context of the education of consumers, about what it means to be unlicensed, did labeling come up as an issue? And I don't mean in the instruction

manual at the back where it says Part 15. We've always been challenged with having that mean anything to a user. But I know in the past when labeling has come up, that has been rejected soundly by policymakers and some of the industry representatives.

So that question is to Michael. The first question to Karl.

MR. NEBBIA: Well, I think the one rulemaking you're talking about is probably the most notable case where we've asked for something and I think it's actually closer to 20 years --

MS. WARREN: Oh, sorry.

MR. NEBBIA: -- we've been waiting for the response. But the place actually where we do it is generally NTIA formulates the outcomes of every WRC and puts a proposal on the table to the Commission of a lot of allocation changes and generally -- so that's the place where we have done this the most in the past, --

MS. WARREN: Okay.

MR. NEBBIA: -- but it's not something we do very regularly.

MS. WARREN: Thank you.

CO-CHAIR ROSSTON: Michael, did you want to respond to the question? Then we'll get to Rick.

MR. CALABRESE: Yeah, sure. And, you know, again others can pipe up if they remember more about this. We did discuss that in the sense that we -- you know, I remember someone suggested that the labeling requirements should be more strict because there's a tendency for manufacturers, for example, they may include the information but bury it in an instruction manual or some other insert in a box that consumers throw out when they first open it.

But that tends to fall so squarely in the FCC's side of things, that we didn't pursue it in any greater detail, although if NTIA wants us to, we can try.

CO-CHAIR ROSSTON: Okay.

DR. KAHN: Although I think we also did observe in the Committee that realistically consumers haven't got a clue what these things are. They don't even know they're radios half the time. And to expect that somehow we can educate them, you know, about what they've got in a way that does some good, was probably -- you know, it was a wonderful idea for all of the wireless professors in the world who didn't want to go for tenure, they could set up commercial shop educating consumers, but realistically it wasn't going to happen.

CO-CHAIR ROSSTON: So that was Kevin Kahn.

DR. KAHN: Yes.

CO-CHAIR ROSSTON: And now we have Rick Reaser.

MR. REASER: Yeah. I don't want to diminish the role of the manufacturers and the people who build these things, but I think

that the regulator needs to take a stronger role in this whole matter, really. I have one of those garage door openers and I think I may have told you about it.

It didn't work and, you know, I'm like sort of an engineer, so I needed to fix that thing because this could last forever given the proper attention. And what I found out was when I called the manufacturer, they were not permitted to sell repair parts. They're not permitted to sell any of this stuff. He says, `You have one of these bad frequency band, so your only option is to buy a whole new head, the rail, everything, and you have to replace the entire unit.'

Now I happened to find one on eBay, a card, and I found out that I bought a card and it turned out the sensor, other sensor was broken, it wasn't even the card, but I got it to work. But the manufacturer had instructions they were not allowed to even sell repair parts or anything to get everybody

out of that band that was the radar band.

Now fortunately I live by a big UHF radar, so I don't have a problem with it, but, you know, there was some -- they had a rule told that they were not allowed to sell this stuff. I think it's important for regulators to try to help these problems, not just leave it up to manufacturers. Because they would have been happy probably to keep -- actually they probably wanted me to change out every year my garage door opener. I won't -- I passed it. But I just think the regulator does have a role, an important role in this.

CO-CHAIR ROSSTON: So, Michael, you had suggested that you thought possibly bringing this up for a vote to get the Commission recommendation. I think we've had enough discussion and also not sort of having not brought up as an idea that with would vote on these as recommendations at this meeting, then maybe we move that to the next meeting and say that you'll -- that we'll make sure

the people are aware that they're going to be asked to vote on the recommendations at the next meeting, if that sounds okay with you?

MR. CALABRESE: Yes, that's fine. I just wanted to, you know, -- I just wanted to convey that we thought -- you know, we thought you certainly could adopt it if we were ready. But we can wait and perhaps even make some additional refinement.

MR. ADLER: Yeah, we're in the same boat. This is Larry. We're in the same boat. I mean we had kind of had consensus on the --

CO-CHAIR ROSSTON: Yeah.

MR. ADLER: -- Sharing Subcommittee, so these are before the full Committee.

CO-CHAIR ROSSTON: So I think we'll make sure that the -- you know, that these have been discussed at this meeting, and then they can come up -- that people should be aware, and we'll make clear in a cover note

and everything that they'll be available for the next meeting.

MR. NEBBIA: And we'll try to provide any informal comments that we have back, so you can make mods. I think on the unlicensed side we certainly would appreciate consistency in the terminology referring to these different bands, because I just think the terminology generally is wrong with respect to what we actually use, so.

CO-CHAIR ROSSTON: Okay. So why don't we -- I'm good at enforcing ten-minute breaks, so we will take a ten-minute break and be back here in ten minutes.

CO-CHAIR FONTES: It's currently 11:02.

MR. NEBBIA: Just very quickly. Yeah, I know we are going to take a break, but they did provide us a document on an interference-clearing website that I hope we would come back to at the next meeting. And also they did provide a list at the end of

their item that I think I would certainly like to be as clear as possible that any answers that we can get on the questions as originally asked would be helpful, but also looking at this list on page 11, the aspect about how we should accommodate unlicensed operations in an inventory, I think would really be helpful to know where those products are. I'd like to hear what your thoughts on there -- on that.

And then I also think the idea of exclusive bands, I think is something worth looking at since that was mentioned as a possibility in the national broadband plan, but we need to be more specific about it. I don't think a discussion of pros and cons -- I mean if folks really think there are certain bands that that can be done, I'd like to hear what they are. But another conversion of the goods and bads of doing that, I'm not sure is much help to us.

CO-CHAIR ROSSTON: Okay, great.

CO-CHAIR FONTES: It's now 11:03.

CO-CHAIR ROSSTON: Ten minutes starts. And, Mark, you're ready to go in ten minutes.

(Recess taken from 11:03 a.m. to 11:16 a.m.)

CO-CHAIR FONTES: Thank you. Okay. Next item on the agenda, everybody back on the phone hopefully, everybody's back in the room here, the next item on the agenda is the Spectrum Management Improvements Subcommittee's Work.

And, Mark, are you making the presentation?

MR. GIBSON: Yup.

CO-CHAIR FONTES: I know Bryan is on the call as well.

MR. GIBSON: And Bryan will add whatever comments he wants to.

CO-CHAIR FONTES: Great.

MR. TRAMONT: Mr. Gibson is doing -- will do a more-than-adequate job in my absence, I am certain.

SPECTRUM MANAGEMENT IMPROVEMENTS

SUBCOMMITTEE'S REPORT

MR. GIBSON: My co-chair is so kind.

Okay. Well, this is the second report. And what we were looking at was the data types necessary to support what we might call full-scale spectrum management, including compatibility analysis and frequency selection, and how do we get to those datasets.

That's a paraphrase of the question that was in the workplan. Another aspect of that question is: Is this important, which I think we say yes. So cross that off.

The approach we took was to kind of break this down and look at the data elements necessary to do spectrum planning or spectrum analysis and spectrum management. And then looking at other areas, specifically receive-only type operations, unlicensed

operations, and then kind of stepping out into the future world a little bit with waveform data and the data necessary to support it, dynamic spectrum access and cog. radio.

We made a comment about the FSMS that I won't belabor. So we're still looking forward to getting our FSMS brief.

So if you look on page 4, and this was presented, I believe, in Boulder, it was either in Boulder or it was in November. The elements necessary for spectrum planning.

You know this isn't really exhaustive. It's representative. You know you could dwell down on this. And I think in our databases, we have over 150 elements that we use for spectrum planning. But this is it and so we can talk about that as necessary. But, like I said, I put this out there in one of the earlier meetings.

Then we talked about receive-only devices and what that constitutes, and we'll deal with that when we get into the

recommendations. Some of that was addressed in the law that just came out or the bill that just came out. And we really haven't had a chance to go back and tie this back to that, given I think it came out the day before we finished this.

The other discussion was on licensed devices and how we can address that. I want to point to an error in the document that you all have, which I have subsequently fixed in an updated document.

Contacting the FCC, there are 60,000 unlicensed devices, not 160,000. That was an error that I made when I looked at the Commission's Experimental Equipment Authorization Database, and I saw 160,000, and they corrected me on that. So I will send out an updated -- on that --

CO-CHAIR FONTES: Okay, Mark, could you -- could somebody on the phone please put us on mute -- is that how I sound? That's terrible.

MR. GIBSON: Wow. I think it's on mute.

CO-CHAIR FONTES: For those on the phone, okay. Great. Thank you.

MR. GIBSON: Then on page 6 we discussed a little bit about the waveform data and how we would use that. You know that overlaps with some of what Larry Adler's work group is doing.

And then, finally, we talked a little bit about the data necessary to support cog. radio.

So the first recommendation was: Develop a set of -- this is consistent with the recommendation we made in the last report, this set of distributed databases that are normalized. We suggested that the NTIA should look, and we think this is being done with FSMS development, so if that's what's being done, that's great, to flesh out the data necessary for radio antenna and subsequent ancillary databases that will support

waveform, as we talk about later on.

For example, curve data related to carrier-to-interference data; Ti performance, you know, filter data. So that's what we suggested in the first recommendation. Essentially, just get better data on the radio and antenna.

The second recommendation was to support receive-only devices. And consistent with what came out in the bill, you know, we kind of used a little bit of that language and we sort of refer to it in here. The idea behind a radio receive-only device is that they could be, you know as we've seen, a class of devices that won't operate with a specific type of transmitter. And it's been overhanging discussions that we've had for some time. So we suggested that, you know, consistent with what's in the recommendation, that NTIA should look at how they deal with those types of devices, starting at characterizing what types of receive-only

devices that are out there.

And you know we could probably flesh this out a little bit more as we probably have to, but you could look at the ones that are, you know, of great note and then work on down to ones that may be somewhat more arcane. So we may take a stab at that in the future.

The other thing was to accommodate unlicensed devices. One suggestion was to connect with the FCC's Equipment Authorization system. They've made available an API for database administrators for whitespace. And I'm not sure how that would work with FSMS or even with GMF, but at least it's available.

It's not a be-all and end-all database of information for unlicensed devices. What it will probably do is give you a better sense of what type of devices you're talking about. But, nonetheless, it's a resource that's there that we use a lot to identify, you know, what devices are operating

in what spectrum. And further collaboration could occur between the NTIA and the Commission to flesh that out a little better for interference mitigation -- interference management.

Recommendation 4 was to establish a framework for waveform data. That's kind of a sub recommendation off of the first recommendation. Essentially, this is to accommodate devices that will actually be operating in a cognitive fashion, that will use either policies or databases, but will actually have information within the database to do its own interference analysis. So we're thinking of things like Ti curves, Ci curves, and that sort of thing, and then even other waveform data, and so supporting that there was an appendix that described some example waveform data that comes out of the IIT's WiNCom area that Dennis Roberson submitted.

And, 5, this is sort of a highfalutin one. It's just monitor the

developments in dynamic spectrum access and just keep track of that. I realize that's probably a little nebulous, but the idea is that there are developments ongoing through a lot of the work that's being done even right now in whitespace, that might overhang what NTIA does or that NTIA could learn from.

So the suggestion in this recommendation is just that NTIA just keep track of that. And, again, we can flesh that out as we see fit.

I believe that was -- yeah, so that's the report of the Spectrum Management Committee.

CO-CHAIR FONTES: Great. Bry, do you have any other comments to add to Mark's presentation? Tramont?

MR. TRAMONT: Sorry. I had you on mute. I apologize. No, I --

CO-CHAIR FONTES: Story of my life. Okay, great.

I'd like to open it up to

discussion. Any comments, questions?

Karl.

MR. NEBBIA: Yeah. Just once again, Mark, I think in some of the other areas we've often talked about maybe policy perspective changes, and those things generally don't link themselves very directly to dollars. But in this case when you're talking about improvements in our system, almost every proposal you make requires some undertaking to be. And, anyway, you can give some sense of estimate as to what you think that's going to cost, both at NTIA and agency levels, I think would certainly be important.

I did want to note your reference in here to dedicated unlicensed bands on page 5, which -- which I've already crossed over, and we'll work on some other words for that. But I think, you know, how much each of these cost I think is a significant component of moving them forward.

MR. GIBSON: Okay. We'll have

another pass at this and flesh out a little more, and also try to make the responses consistent with some of the comments you made early on. Because we get a better sense of what you're looking for now. Thank you.

CO-CHAIR FONTES: Great. Rick.

MR. REASER: I wanted to ask the question that I had earlier when you talked about, it was like 2 to $4 million to do the checking over the database and so forth. This sort of relates from our Committee.

Has there been any thought about sort of opening up what you can to let people fix stuff on their own? I mean I'll be honest, I made this comment before, if I could fix every record that our company has, I would do it just because out of pure -- to fix it. Because we have a lot of errors on things in our -- for the things we build in terms of all that. And updating some of them.

But the process to update anything is just incredible for us. You know, to

noteholders, it takes a year and a half for something to get processed or to change the -- reverse part numbers on a GPS antenna, by the way, it took us a year and a half to get that fixed.

It just seems like there might be some opportunity if -- and I know that the federal agencies want to maintain control over that, but there's a lot of things that we could do very quickly, including they need to be in charge of all that. But if they could somehow let us help.

And there are other mechanisms that people could help with those things as well, because everybody has way too much to do in every level that we work with, from an industry contractor all the way up to you. And so some of our stuff gets delayed.

A certification will sit at just the next level, which is a major command level for a year, just -- I mean we get assignments in the meantime to do that. But like, my God,

by the time we get stuff actually formally approved, the program has been terminated, I mean like four years later.

So it just seems like there might be some other mechanisms rather than the same old ones doing the same old people doing the same old things because their plate's just a hundred miles tall. It just seems like -- or we say we're not going to do it. I mean you got to make a decision here.

MR. NEBBIA: Sure.

MR. REASER: That's my comment.

CO-CHAIR FONTES: Thank you, Rick.

Are there other comments?

Karl.

MR. NEBBIA: I've got a response. Yeah, I certainly think there are probably places where we look at some of our processes where you probably say we just probably shouldn't do that. We should cut this down, cut that down. We're looking at the spectrum certification process. Which of those do we

actually need to look at, which do we need to review in depth and which don't.

Also there may be processes where we can come up where an agency supplies someone who could do the review essentially on our behalf where all we have to do is review the outcome, and that sort of thing.

I think also as we look at, for instance, databases of unlicensed devices, and so on. If somebody in the industry found that in their interest to produce such a database, that we could go out and check out, and when we're making a choice, that certainly is easier than us having to go back and come up with -- you know, go to the Commission and petition them to please create a database that shows us this and that.

I mean we're already running into issues as we try to discuss the data that we're putting in FSMS and what's required for these analyses and so on. And asking the Commission, 'Well, what will you do with all

these data requirements on your side,' because we're going to be interacting in our databases and shared bands and so on. And I know there's a lot of concern over there about each one of those things would require them to go back out with a rulemaking, demanding more data from all their constituents, and so on.

But I do think you're right, Rick. There are probably places where we could consider how could we get industry or the user, not -- I don't want to say the user groups, meaning the end users, but the manufacturers involved with certain things to possibly work on some of these component pieces to simplify the job that we have.

I mean we already rely heavily on our agency users to help us in the process. That's what the IRAC's about, the Frequency Assignment Subcommittee, for instance, although we do look at the data that comes in to make sure as far as we can tell the data's correct. It's the agencies themselves who

analyze the request and determine whether it's going to bother them, so we're already heavily reliant on them. But I think that's an aspect as we look at these tasks that are going to cost something. Maybe we can look at who might actually be willing to do them.

MR. GIBSON: Let me just -- this is Mark again, one quick comment.

You know with whitespace there is a database of unlicensed devices. I'm not sure how good it is just yet, but in time it will be the database that commands how these devices operate. And the rules require that certain devices register in there, so you'll be able to use that.

And then as it matures there will be other metrics we can pull out of that to help with this as well. And also that this be sort of a de facto -- actually a de jure database of unlicensed wireless -- unlicensed and licensed microphone operation. So I'm not sure that that is -- you know, it's a

microcosm of all the unlicensed use, but we can do some statistical analysis on it, perhaps, and maybe make some determinations, but it will be there.

MR. NEBBIA: Great.

CO-CHAIR FONTES: David, do you have a comment?

DR. STANCIL: Dan Stancil, NC State.

CO-CHAIR FONTES: I'm sorry.

DR. STANCIL: I was just thinking about combining the ideas of Rick and then Kevin had mentioned earlier about updating the database that if it -- Rick was -- Kevin was talking about how perhaps flags could be set so you would know how reliable the data was, how recently has this been checked and so forth, or who checked it and that sort of thing.

If you opened it up and sort of some of the databases up in a Wikipedia style so that anybody can go in and change them, of

course then there would be the same questions with Wikipedia about how accurate is the information. But if you -- if there were intermediate flags, like you had to identify who had updated it, you could say, okay, has this been -- has this update been authorized by -- or verified by NTIA or was it the manufacturer, or something else.

And I would imagine with some sort of open kind of Wikipedia style approach, that the overall accuracy -- or errors of the database over time would gradually diminish. Just combining those two thoughts sort of.

CO-CHAIR FONTES: Great. Thank you, Dan.

Greg.

CO-CHAIR ROSSTON: This is Greg. Thinking about something you said earlier made me think that you have 250,000 records, or something like that. It seems like that one of the things we should be thinking about in all of our recommendations is prioritization,

that a lot of these are probably in bands that are never going to be shared, and we don't need to update those. We want to set it up in a way that we look at the bands that are going to be prioritized -- going to be possibly available for sharing and get those done first and not look -- you know sort of the industry can update other things, but your resource is -- should be focused on really doing it in a small subset and in some sort of order. And maybe that could be put into the recommendation.

MR. GIBSON: This is Mark.

And that was implicit in the recommendation. We'll just make it explicit, because when we were looking at this we realized that they're not going to look at the whole database at once and try to do it all at once. Karl and I had some follow-up discussion, and the intent was we'd start probably with the 500 MHz we're looking at.

Ideally since some of that -- and

that spectrum is part of the next tranche that gets released, presumably that we'd have to go through that and not put it on industry to go back and forth to try and make the corrections in real time. So we'll go back and make those recommendations more explicit in another draft.

CO-CHAIR FONTES: Yeah. And I think Dale presented a recommendation earlier in the discussion about rather than doing a census of all the band, if you will, you could do a sample to kind of get an error rate.

MR. GIBSON: Right.

CO-CHAIR FONTES: And that can give you a read as to whether or not additional work needs to be done to do a deeper dive in that particular band you're examining.

MR. GIBSON: And some are worse than others, that's true.

DR. HATFIELD: I'm just saying too I realize I'm a broken record here, but you

not only have to worry about the band, you have to worry about the bands on either side in some of these cases too. So you can't just focus on just the band. Sorry. I think I have a one-track mind today.

CO-CHAIR FONTES: That's an excellent point, Dale.

MR. GIBSON: Good to be consistent.

CO-CHAIR FONTES: Okay. Any more discussion?

MR. ROBERTSON: As an aside, Dale, when you get a chance I need to talk to you -- this is Dennis -- on exactly that subject.

CO-CHAIR FONTES: Great. There we go.

Any further discussion of Mark's presentation? Great. Okay. We're onto the next agenda item and we're pretty much -- pretty close to schedule. This is the Next Steps/Open Discussion.

NEXT STEPS/OPEN DISCUSSION

CO-CHAIR FONTES: I'd like to start out actually myself and have you think about this as you make the recommendations. We had an opportunity to speak to some of the folks last night who sat around the dinner at the lovely hotel -- or the inn, excuse me. And one of the things, you know every now and then you keep putting yourself back into the chair of the policymaker. And we're going through each of the recommendations and each Committee will make several recommendations over the course of all the work that we're doing in the CSMAC.

And if I were sitting in Larry's chair or Julius Genachowski's chair or anybody's chair that's a policymaker that has to make fiscal decisions, each recommendation comes with associated cost. And so what I think would be helpful in all the recommendations that are being made, and we're doing this actually in the CSMAC, in the Committee that Larry Fleury and I chair, we're

actually prioritizing the recommendations. In the case in CSMAC we're prioritizing the standard -- CSRAC, excuse me -- prioritizing the standards that needs to be done immediately midterm and long term.

And it just helps kind of focus what work needs to be done in the order, if you will, in terms of priority. And then in reality, some of these recommendations may be listed as recommendations or they may be listed as kind of items of interest or factors in your deliberation, rather than specific recommendation.

So I'm just going to open that up. I think this would be helpful. Sometimes in some cases it may be even doable to try to provide a dollar figure associated with the recommendation, to kind of get an impact, but you may not be able to fully provide that type of information just because you may not know all the information necessary associated with the recommendation.

So I'm just going to throw that out there for your comment or deliberation. Any comments on that.

Gary.

MR. EPSTEIN: Obviously I think it's a good idea, but one of the things you're going to have to face is the fact that as we've -- we knew before and we learned again today that there's a lot of overlapping recommendations.

CO-CHAIR FONTES: Um-hum.

MR. EPSTEIN: And so it's got to get up to the full Committee level for that to make any sense at all. I don't know quite how you're going to do that. We can make recommendations as subcommittees, but when you put the whole thing together, somebody's going to have to look at it and do what you're suggesting.

CO-CHAIR FONTES: Thank you.

Jennifer.

MS. WARREN: This is Jennifer

Warren.

No, I think that's a really good idea, but also I think focus on creating a more integrated CSMAC output, because right now we've got kind of stovepiped, if you like, outputs that we all vote on, but that have been created and developed and discussed, but not really, I think, prioritized in any way. It's kind of just shot across the transom. And I think that could be a really good value, so.

CO-CHAIR FONTES: Yeah, it'll be work, to your point, Gary, because we all have our vested interests and our specific recommendations. But as a collective group, coming together and prioritizing the recommendations will, I think, in large part provide a roadmap, in large part be able to identify a recommendation and distinguishes a recommendation from perhaps a course of action you may wish to consider.

MR. REASER: Yeah, I agree. This

is Rick Reaser. I agree it would be a good idea for us to prioritize our recommendations and maybe recategorize some of them as advice, or something like that.

The other thing we talked about, though, and it would be interesting to see Mr. Strickling's reaction to this one, not only prioritizing our recommendations but you know one of the things that sort of came across me listening to Karl and his -- he really only has 20 people that actually do spectrum management, when it comes right down to it, because the rest of them do lots of other things. But maybe NTIA would like some ideas or some advice about how he might prioritize his own work in terms of OSM, and so forth. You have like a billion things to do, all these recommendations have come out for years and years and years, and you don't have anybody to work it and no budget to do it.

What I was going to recommend in addition to prioritizing our own

recommendations on the CSMAC, the NTIA OSM may be interested in having us take a look at their giant laundry list of things and maybe giving them some ideas about what we think is important from our perspective, in terms of prioritization of that.

They have very few people, a very small budget to do way more things than is humanly possible. And so that might be something that might be of help to them, may not be. But I just want to toss that out there, something we talked about at dinner last night.

MR. STRICKLING: So this is Larry. And -- although I think we'll definitely let Karl respond to that as well. Part of our issue is we have way too many people trying to set priorities for us. Right now we're --

(Laughter.)

MR. STRICKLING: We have a Hill report that's due in a couple of weeks, where again they basically said go do these things.

And they did it in an appropriations report. And of course there was no money for any of this, but it was kind of like just do it. So, you know, I think it's a testament to the incredible job Karl and his people are doing, that they are managing through all of these issues. And we haven't even talked about the kind of resources we had to put onto Light Squared in the last 12 months and some of the other issues that have come into us without any warning or any preplanning.

So I don't know how helpful it would be for you folks to kind of go through the entire list. I mean that, in effect, is what they're paying Karl and me to do. And we have to balance a tremendous number of competing interests as we determine how to allocate resources. But at the end of the day Karl has to get the spectrum assignments done for these agencies.

So it kind of begins and ends with making sure we can get that done, because we

can't just say, 'Oh, well, let's take all those people for three months and put them on one of these interesting tasks here as much as we might like to,' and even where it might lead to some improvements down the road. So we have to figure out ways to kind of keep adding to the airplane while it's still flying.

But, Karl, I don't know if you have other thoughts you want to share on this.

MR. NEBBIA: Yeah. I mean I think one of the challenges is certainly when we are assigned things by law, we don't really have a choice. So would an evaluation of the priorities of those things be helpful, probably not. I'm going to have to do them. You know we need to do them anyway, so.

There are probably areas of the work that we do where you have contact with it. I know there are a certain number of you that actually do have direct contact with our processes regularly through your companies or

working with agencies and so on. And if there are things that you feel like we could just -- we don't need to do, I think that's worth discussing so that we could simplify some of the processes we have.

And also you know as you run into some of our workplan, if you see things that we're studying there that we probably don't need to study because we've got engineers working on this task and that task, I mean we still -- the presidential memo from the previous administration is still in effect. And we've got a list of topics there we're supposed to work too. So I just think there's a certain amount it could help in areas that you particularly have contact with, but I'm not sure we're going to be able to make much of --

MR. REASER: So let me tell you that the reason I brought this up was that sometimes it's helpful to the agency to have an outside source sort of point out the fact

that you're totally overwhelmed, worked, and swamped because people may not realize that. They just think NTIA has got four letters, must have four billion people in that thing to work on this, you know. So that was sort of the -- one of the issues I'd say.

Another thing, we could be the prioritizer of the prioritizers. I wouldn't mind doing that job.

CO-CHAIR FONTES: Okay. Well, I just put that out for comment. And I think it would be helpful just as you work on your individual, to Jennifer's point, stovepipe committee activities, if you were to try to do some prioritization of your recommendations and look at it in terms of short term, medium term, long term type of priorities.

And then also take a look at them to see how many of them truly are recommendations in the true sense of the word of recommendations for change or things that could be considered by NTIA as advisement, if

you will, and how to achieve what it is that ultimately we're recommending. So I think that that may -- I hope that will help you out.

MR. NEBBIA: I think one thing we could consider is putting together, I think Jennifer's right, it would be easier to come up with the prioritization when the whole Committee's considered something and fits it in with the other recommendations that have been met. So I think if we pull like we've done in our document, pull each of the recommendations up and maybe ask you to look at it in terms of priority, in terms of is this easy to do versus hard to do, shortterm versus long term, and then specifically with respect to high value or low value.

And we look at tasks that we're trying to change within NTIA, we're always asked to consider them: Are there high-value items that are easy to do versus hard to do.

And then ultimately I think to

prioritize the list, if you're able to do that. And because we realize you have limited time too and focusing the recommendations into ones that are things that we could get done and prioritize as opposed to just continually adding to the list has certainly got a lot of value to it.

CO-CHAIR FONTES: Sure. And I think it would be helpful too, and we can work with Bruce in just trying to pull a list of recommendations that have been made already, so that we can have a chance to review those and begin to start the thinking process of how to rank them in terms of shortterm, long term, intermediate, et cetera, and the value associated with it.

At this time I would like to open it up for public comment. During our meetings we have the opportunity for the public to provide comment. So right now the floor is open.

PUBLIC COMMENT

MR. SNIDER: I have a question.

CO-CHAIR FONTES: Could you identify yourself, please?

MR. SNIDER: Yeah. My name is Jim Snider.

CO-CHAIR FONTES: Thank you. Go ahead, please.

MR. SNIDER: Hi. This is Jim Snider. Can you hear me?

CO-CHAIR FONTES: Perfectly.

MR. SNIDER: Yeah, great. So, first of all, I wanted to say that the webcast quality was quite high and I could follow it. And I appreciate that.

A few questions that I have about the webcast. The notice that goes to the Federal Register doesn't actually mention whether the meeting will be webcast. Since this is several thousand miles away and it's expensive to fly, you'd have to make a reservation ahead of time. Knowing whether it is going to be webcast or not -- rather than

having to wait basically till the last minute to find out it would be, you know, a great courtesy for members of the public to have that information ahead of time, given the cost.

Another issue is that the main work of the CSMAC is really done in Subcommittee. I was not able to find any Subcommittee information on the website. Perhaps I missed it. I don't know. And the reports often don't include any Subcommittee information. Since that is the key working unit of CSMAC, it would be helpful if you would publish that.

Do you have any thoughts about or problems with publishing the names of Subcommittee members on the website and all the relevant Subcommittee reports? The question is to Brian.

CO-CHAIR FONTES: Sure. The appointments of the Subcommittee or the people assigned to subcommittees is generally

available. I don't know, is that already on the website. Bruce, do you know?

MR. WASHINGTON: The Subcommittee people are in the committee, so we could post the Subcommittees on the website.

CO-CHAIR FONTES: Yeah. That should not be an issue, Jim.

MR. SNIDER: Okay. Well, it would be nice to be posted on the website and on the Subcommittee reports.

CO-CHAIR FONTES: Oh, I see what you're saying, to identify the individuals who worked on the reports in the Subcommittee, so that --

MR. SNIDER: Yeah. Yeah, --

CO-CHAIR FONTES: -- the Subcommittee's identified in the report.

MR. SNIDER: -- titles as co-chairs, or whatever it is -- also to be designated.

CO-CHAIR FONTES: Kevin.

DR. KAHN: Yeah, Kevin Kahn.

Officially I just wonder what the status of that is. I mean from what I can tell, we are allowed to drop into any of the Subcommittees and participate, so --

CO-CHAIR FONTES: That's correct.

DR. KAHN: -- those Subcommittees are -- while we try to, from an organizational perspective of holding meetings and things, the core group is sort of scheduling them, and whatnot. I don't believe they're in any way exclusionary as to who on this larger group is part of it, so --

MR. SNIDER: Well, if that's the case, that could raise a FACA concern, because at some point it would be treated as a Committee of the Whole, so that would be problematic, actually, if -- I mean it would depend on how many were there. And then there's no enforcement mechanism. If nobody knows --

MR. REASER: Mr. Chairman, --

MR. SNIDER: -- a violation. I'm

not saying that there's enough people in setting these Subcommittees to reach that direction, but it would be a concern. So I think in terms of consideration for FACA and just public transparency, if you listed the co-chairs for each Committee and for each Subcommittee. If there is a fixed body, and I think people need to know how many people are intended if it's larger than a core group.

CO-CHAIR FONTES: Okay, Jim, thank you. And what I'll do is --

MR. SNIDER: Anyway, let me just go on. I'm just about done. It would be helpful to me, when I call the Designated Federal Officer for CSMAC and I ask for information, and he says he won't talk to me, I have to put everything through, make a formal FOIA request, even if he knows that he doesn't have the information, I think that's a problem. I think CSMAC should agree that if their document isn't available, it would be polite and considerate for the public to just

be told that it isn't available.

I'll just give you two very quick examples. I asked for the webcasting budget last May after it was announced that it would cost $6,000 to cover it and you weren't going to be webcasting anymore. And also that subsequently when I was told that 50 percent of the meetings were going to be webcast, I asked if there was any written -- if that was written down anywhere as a policy, and I was told I could not ask those questions, I had to do a FOIA request.

It takes me many months in going through a whole process to get an answer to something that should take a couple seconds. And it would save NTIA money, why pay a high-priced lawyer to go through and write all these letters out telling me, you know, what the FOIA -- that the fees are and whatnot and going back and forth, when you can just have simply said, no, we don't actually have those documents.

So I guess the question is if somebody requested documents and it's clearly known that it doesn't exist, why can't the Designated Federal Official just say it doesn't exist. Does that sound reasonable to you, instead of making somebody go through such a process?

CO-CHAIR FONTES: Jim, thank you for comments. And what I'll do on this, I've not had any previous conversations on this matter with the Designated Officer, allow me to work offline with the Designated Officer in trying to address some of your concerns; is that fair?

MR. SNIDER: Okay. And just one last point of clarification. At the last two meetings, Brian, you said that you didn't want to take procedural questions and public comment because that's part of the notice, and it was done during the meeting and during the summer, when there was no option cause the phone quality was quite poor, but it came up

at the last meeting. You didn't insist on that.

But I would like to be clear. Do you have a policy about not allowing public comment on the process, the CSMAC procedures, or is that not a policy?

CO-CHAIR FONTES: Do I have a policy on CSMAC procedures; is that the question?

MR. SNIDER: Well, you announced at both the summer meeting and the fall CSMAC meeting that you only wanted questions during public comment or comments relating to specifically spectrum issues rather than process issues. So I wanted to clarify. Is that something that you are making a policy. What was the nature of those statements? Because I don't know whether to prepare formal comments or not when I don't know whether, you know, they'll be accepted. I mean you have to, as a practical matter, allow me to speak this time and during the fall meeting. Again,

over the summer there was a technical problem. But I'd like to know. You know, you made those statements. I want to clarify, you know, what you meant or whether you were just making some type of general advisory, you know, -- putting up an issue for discussion.

CO-CHAIR FONTES: Okay. Again I apologize, Jim, for -- you know, I'm trying to remember what I actually said when I said it. What I'd like to do is, if I could, just pick up a conversation with you offline to --

MR. SNIDER: Okay.

CO-CHAIR FONTES: -- to understand the question more clearly, frankly, regarding policy. I think the purpose of --

MR. SNIDER: Well, I just went to your own statement that you made publicly not once but twice --

CO-CHAIR FONTES: Okay. And that's fair.

MR. SNIDER: -- into the record, yeah.

CO-CHAIR FONTES: That's fair. But I mean I just need to go back and take a look at the statement. I don't have it in front of me, so I'd prefer just to, if I could, take it offline --

MR. SNIDER: Okay.

CO-CHAIR FONTES: -- with you and give you a call.

MR. SNIDER: Okay, fine.

CO-CHAIR FONTES: Do you have his number, by the way? A way to reach him? Okay.

MR. WASHINGTON: Yes.

CO-CHAIR FONTES: Are there other -- thank you, Jim.

Are there other folks who have comments at this point, public comments? Okay. Thank you. The next item on the agenda is scheduling our next meeting.

And, Bruce, I'll turn that over to you.

MR. WASHINGTON: So welcome,

everyone. To close out, the next scheduled CSMAC is July 25th in Boulder, Colorado.

Jennifer, you looked at me. I thought I coordinated with you -- 25th. In concert with the NTIA's AISART. And that's it.

CO-CHAIR FONTES: Okay. Perhaps between now and then we could also work on -- that was the area where we had a problem with the conference bridge, so we may want to be able to try to address that ahead of time.

Great. I want to thank everybody for their time today.

Larry, do you have any concluding comments?

MR. STRICKLING: Thank you. I thought it was a very productive meeting.

CO-CHAIR FONTES: Great. We stand adjourned. Thank you very much.

(The meeting was adjourned at 11:53 o'clock a.m.)

Y

C E R T I F I C A T E

This is to certify that the foregoing transcript

In the matter of: Commerce Spectrum Management Advisory Committee

Before: US DOC

Date: 03-01-12

Place: Stanford, CA

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