UNITED STATES OF AMERICA
DEPARTMENT OF COMMERCE

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COMMERCE SPECTRUM MANAGEMENT
ADVISORY COMMITTEE (CSMAC)

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MEETING

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THURSDAY
NOVEMBER 10, 2011

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The Advisory Committee met in Room 4830, Herbert C. Hoover Building, 1401 Constitution Avenue, N.W., Washington, D.C., at 9:00 a.m., Brian Fontes and Gregory Rosston, Co-Chairs, presiding.

PRESENT

DR. BRIAN FONTES, Chief Executive Officer, National Emergency Number Association, Chair
DR. GREGORY ROSSTON, Deputy Director, Stanford Institute of Economic Policy Research, Stanford University, Chair
DR. LARRY ALDER, Product Manager, Google, Inc.

DR. DAVID E. BORTH, Independent Consultant
MICHAEL C. CALABRESE, Vice President and Director, Wireless Future Program, The New America Foundation
MARTIN COOPER, Chairman, Dyna, Inc. *
MARK E. CROSBY, President & Chief Executive Officer, Enterprise Wireless Alliance

DAVID L. DONOVAN, President, Association for Maximum Service Television, Inc.

GARY EPSTEIN, Managing Director and General Counsel, The Aspen Institute IDEA Project
MARGARET (MOLLY) FELDMAN, Vice President of Business Development, Verizon Wireless*
DR. HAROLD FURCHTGOTT-ROTH, President Furchtgott-Roth Enterprises
H. MARK GIBSON, Director, Business Development, Comsearch
DALE N. HATFIELD, Executive Director, Center for Law Technology and Entrepreneurship, University of Colorado
DOUG McGINNIS, IT Manager of Communication Infrastructure Strategy, Exelon Corporation
DR. MARK A. McHENRY, President, Shared Spectrum Company
DR. ROBERT PEPPER, Vice President, Global Advanced Technology Policy, Cisco Systems, Inc.
CARL POVELITES, Assistant Vice President of Public Policy, AT&T
RICHARD (RICK) REASER, JR., Head, Spectrum Management Department, Raytheon Space & Airborne Systems
DENNIS A. ROBERSON, Vice Provost for New Initiatives and Research Professor of Computer Science, Illinois Institute of Technology*
DR. DANIEL DEAN STANCIL, Head, Department of Electrical and Computer Engineering, North Carolina State University
THOMAS J. SUGRUE, Senior Vice President of Government Affairs, T-Mobile

BRYAN TRAMONT, ESQ., Managing Partner, Wilkinson Barker Knauer, LLP
JENNIFER WARREN, Vice President, Technology Policy & Regulation, Lockheed Martin Corporation
KARL NEBBIA, Associate Administrator for the Office of Spectrum Management

* Present via telephone

C-O-N-T-E-N-T-S

P-R-O-C-E-E-D-I-N-G-S

9:17 a.m.

CHAIR FONTES: Good morning, everyone, and welcome to our meeting this morning. The 10th of November already, can you believe it? Time passes, unfortunately, way too quickly.

We have blocked a few hours this morning, but if we're diligent I think we will not consume all of those few hours. I know one of the Committees have been gracious enough to recognize ahead of time that they probably won't take the full limit of their presentation.

So, I just wanted to welcome everybody.

And now it's my pleasure to introduce Larry Strickling. Larry is the Assistant Secretary of the Commerce Department for Communications and Information, Director of NTIA.

ASST. SEC. STRICKLING: Thank you,

Brian.

I just want to welcome everyone to today's meeting of the CSMAC, and as always thank all of you for your hard work over the last several months working on our set of issues for this year.

I do have just a couple of announcements to make. First, while he was, I think, present in Boulder for the meeting in July he had not yet officially joined us, but I do want to introduce our new Chief Technology Office Doug Sicker who is here in the front of the room, who is now officially on board. And in addition to serving as Chief Technology Officer, he's also my Senior Spectrum Advisor, working with me and Carl and his whole organization.

Also, we did make three reappointments for the three members of CSMAC whose terms are a little out of cycle with everyone else, but I do want to recognize that Michael Calabrese and Gary Epstein, as well as

our Co-Chair Greg Rosston, have been officially reappointed to the CSMAC.

Obviously, spectrum issues are quite focused these days, both in terms of the work of the Super Committee as they look for new revenue sources and we continue to work those issues. The search for 500 MHz, which you all are helping us with.

Next year, we see the year being equally active. We have a report that came out several months ago from the GAO that we will be taking up its recommendations next year. And, again, the Committee that's been formed here to look at federal spectrum management operations, we're anxiously looking forward to your recommendations in terms of how we can plug that into that overall review.

And with Doug on board, and as well as renewed interest in how do we continue to get more and more efficiency out of the spectrum resource we have available to us, we'll be spending a lot of time next year

looking at the whole issue of spectrum management, spectrum assignments, both in terms of what we do here at NTIA as well as coordinating better with the FCC in terms of some of these issues. So, major, major work we'll be doing in this area over the next 12 months or so.

So with that, I'll turn it back to Greg and Brian.

CHAIR FONTES: Thank you.

I'd like to turn the mic over to Greg for a minute.

CHAIR ROSSTON: Sure. I just wanted to thank everybody for all the hard work that's been done. It's very good to see how engaged everyone has been. I think sort of having the structure of answering specific questions that Karl helped us come up with, his idea has been really good in that we are making a lot of progress and, hopefully, helping out the Department of Commerce with not only the search for 500 MHz, but lots of

different questions on how government spectrum management should go forward. And I think that this has been a good chance for us to look at the recommendations and to have lots of discussions at the meetings.

One request that I think both Larry and I both have would be is that if you could all turn your name tags around so that we could see who you are. That's my one nice thing, so we could know who everyone is down there.

And I think that we should get started with the meeting and with the reports.

MEMBER ROBERSON: This is Dennis, just to let you know I was here. Actually, I was here long enough that it bumped me off, so I'm back on.

CHAIR FONTES: Very good.

What I thought we would do next is just go around the table so the folks on the phone would know who is actually here at the table. And then the folks on the phone, could

you identify yourself so the folks here would know who is actually on the phone?

So, Mark, could we start with you please?

MEMBER GIBSON: Mark Gibson, Comsearch.

MEMBER TRAMONT: Bryan Tramont, Wilkinson Barker.

MEMBER BORTH: Dave Borth, independent consultant.

MEMBER HATFIELD: Dale Hatfield, University of Colorado.

MEMBER McGINNIS: Doug McGinnis, Exelon.

MEMBER CROSBY: Mark Crosby, Enterprise Wireless Alliance.

MEMBER DONOVAN: David Donovan, New York State Broadcasters.

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

MEMBER WARREN: Jennifer Warren, Lockheed Martin.

MEMBER REASER: Rick Reaser, Raytheon.

MEMBER McHENRY: Mark McHenry with Shared Spectrum Company.

MEMBER EPSTEIN: Gary Epstein with Aspen Institute.

MEMBER POVELITES: Carl Povelites, AT&T.

MEMBER SUGRUE: Tom Sugrue, T-Mobile.

MEMBER CALABRESE: Michael Calabrese, American Foundation.

MEMBER ALDER: Larry Alder, Google.

MR. NEBBIA: Karl Nebbia, NTIA.

CHAIR FONTES: Great, thank you.

Now if we can go to the phone. Please identify yourself.

MEMBER FELDMAN: This is Molly Feldman, Verizon Wireless.

MEMBER ROBERSON: Dennis Roberson from IIT.

CHAIR FONTES: That's it for the phone? Excellent.

MEMBER COOPER: Martin Cooper for Dyna here.

CHAIR FONTES: Oh, hi, Marty. Okay.

Anyone else on the phone? Great.

We're also fortunate to have a few people in the audience today. So, glad that you're here.

And now we'd like to turn it over to our first Committee, which is the Search for 500 MHz. We're glad that Gary's not on jury duty this morning, it's always nice. And Carl, thank you for coming in from Atlanta. And I actually used your official name, your birth name here, so that's a good thing.

MEMBER POVELITES: I appreciate that, Brian.

CHAIR FONTES: And I recognize, too, that for those that printed out the agenda that was circulated last night, there

were comments provided to your report from Janice Obuchowski. And you may want to comment to that in terms of if there's any substantive or nonsubstantive impact it would have on your recommendations.

MEMBER POVELITES: Thank you, Brian.

First off, we'd like to really thank the working group. Up front we had a flurry of activity prior to the Boulder CSMAC meeting. Great work effort by all the team members, and we really do appreciate that effort.

At the Boulder meeting we discussed the Search for 500 MHz presentation that was put together, and the slide deck. Had a very good discussion.

After the Boulder meeting Gary and I took back all the comments that were received from that meeting and got our two helpful co-working group members, Steve Sharkey and Molly, together and we looked at

the deck and report, and revised some of the parts of the decks. In particular, we made some changes to slide 7, 9, 10, 12 and 20. I'm not going to go through those because they've been out there for a while now. They're pretty non-substantive changes, but they are important changes.

In addition, we added a recommendation page which was based on discussions at the Boulder meeting. These recommendations, if you want to go to the next slide, first off, NTIA should utilize LTE Technical Characteristics attached as an Appendix, use the Appendix that's in the binder for its initial interference and other analyses, and should work closely with industry to fully understand the system impacts and refine the analysis and sharing solutions. That's Recommendation No. 1

Recommendation No. 2: NTIA should implement an informal process, consistent with all applicable laws, to directly exchange data

and have a dialogue between government and industry in order to facilitate and implement the spectrum recommendation in the report.

Recommendation No. 3 was: NTIA should stage the availability of its 1755 to 1850 MHz band for commercial use with a priority on the early availability of 1755 to 1780 MHz, and extending in contiguous stages as necessary to accommodate the relocation and retuning of government users.

And finally No. 4: NTIA should make spectrum available such that commercial users have exclusive use of the spectrum; however, given existing government uses, industry supports making spectrum available subject to predefined sharing zones where the commercial users accept reasonable and defined levels of interference.

Those are the recommendations we made on August 10th. We sent the revised presentation to the full CSMAC, at which time we did not receive any comments or suggestions

for revisions.

In early September, as Co-Chairs Gary and I sought counsel from the CSMAC co-chairs and NTIA on how to get these recommendations formally adopted so that they could be considered in the NTIA Report.

On September 20th, NTIA posted the recommendations on the NTIA website. And they also sought public comment and input into the process. At that time, no comments were received, and we were told by NTIA that we could adopt these recommendations at a meeting, and that meeting is today on November 10th. We were, however, assured that the NTIA was aware of the subcommittee's report and would take the draft report into consideration in doing their work for their report they're preparing for the 1755 to 1850. However, that they had to treat the subcommittee report not as an adopted recommendation because future further changes could be made.

Subsequently to that being posted,

we didn't again receive any comments. However, two days ago Janice Obuchowski submitted some comments on the NTIA website and stated that she had a couple of suggestions. For the most part, Gary and I talked about her recommendations and feel that they don't necessarily change and they don't change the recommendations that were made and posted by the subcommittee.

There are a couple of clarifications, particularly with regards to slide 5 on adding "when feasible" as a caveat to "clearing spectrum should be the goal." That does not seem to be a change that we would oppose and would be fairly easy.

The other recommendation is that regarding Recommendation No. 3: "NTIA should stage the availability of the 1755 to 1850 band," she notes that any relocation decisions must address up front how relocation should be addressed for users across the band. In our discussions we felt that while that has been

discussed a lot during the subcommittee, it does not necessarily change anything with regard to the recommendations of the subcommittee to the full CSMAC.

Gary, you might want to --

MEMBER EPSTEIN: I think Carl has accurately stated both the procedural and substantive history. From a substantive standpoint, we had two excellent presentations by our co-chair, subcommittee chairs last time in Boulder. We made the changes to incorporate those with this presentation. And the report has been on the record for a number of months now. The recommendations did not have any comments.

We became aware of Janice's additional comments, which because they're from Janice, they're fine, and they're quite good, and they are in the nature, in my view, of a clarification of it.

So, up to the co-chairs here, but my recommendation would be the report be put

up for a vote and Janice's views be attached as additional views to the report. I see nothing in there which is contrary to the recommendations in the report.

CHAIR FONTES: Right. So basically what we have now is your report with Janice's recommendations basically as an attachment. And you're recommending or basically putting in place a motion to have this accepted at this meeting, correct?

MEMBER EPSTEIN: We so move.

CHAIR FONTES: Great.

Jennifer?

MEMBER WARREN: Yes. Could I ask for a point of clarification on Recommendation No. 4?

And I don't have a microphone.

Just to clarify for the record, Recommendation No. 4 is limited to 1755 to 1850, given the work that was going on, I think, on the broader sharing discussions and policy approaches, because there's a much

broader view that that's quite underway with respect to whether or not spectrum should be available on an exclusive basis. So this is limited to your discussions of 1755 to 1850, that's one thing and if so, should be so noted, because I think we have, again, a broader discussion underway in another group.

MEMBER POVELITES: That's fine. Yes. It is limited specifically to the 1755 to 1850.

MEMBER WARREN: Perhaps that could be modified to reflect that, because it is a little inconsistent as to which ones are broader, given the title of this report.

But my second point of view I'd like to just associate with Janice's points. I think you're right; they may not change the actual substance of your recommendations, but are important elements that give texture to them. So, I'd like to associate with them. And I would propose that they be included in what is actually put up for approval and their

attachment to your report.

Thank you.

CHAIR FONTES: Okay. Just so we can keep on track here, there's a motion basically to make these recommendations or present them to CSMAC.

Before there was a second, there was a discussion item basically that wanted clarification to ensure that the fourth point was specific to the 1755 to 1850 band and recognizing that Janice raises good comments, if you would, as an attachment to this report.

Michael?

MEMBER CALABRESE: Yes. I would just actually follow Jennifer to clarify. My interpretation is that we approve all four recommendations. That this is about the 1755 to 1850 band. If we we're talking about all the other fast track bands, we'd have to have on target a different conversation, I think, and different recommendations. So, I hope that that's the case.

CHAIR FONTES: Carl, Gary, are you--

MEMBER EPSTEIN: I think we're fine with that. And here's a creative suggestion: We title the document "Initial Recommendations for the 1755 to 1850 band."

(Laughter.)

CHAIR FONTES: Thank you for that subtle but important clarification.

MEMBER POVELITES: So would that provide it with a second?

CHAIR FONTES: Yes.

MEMBER POVELITES: I had an amendment before there was, I guess, a proposal. Discussion time, or do we have--

CHAIR FONTES: Well, first off, is there a second to the motion?

MEMBER STANCIL: Second.

CHAIR FONTES: Thank you. And with that motion, then we'll take in order the edit that recommended changing the title and also recognizing that Janice's comments will

be an attachment to the recommendations. Now I think we're open for discussion.

MEMBER SUGRUE: Recommendation No. 3 is that the band be staged for reallocation, and that was certainly a critical part of the discussion. And while I haven't seen Janice's paper, to the extent Gary described it as additional views, that's fine, additional. But that the Recommendation is that there be a two-stage process and the way it was described, some of it sounded like basically cut -- you know, it could be interpreted as undercutting that Recommendation No. 3. So as long as we understand it's not Recommendation No. 3 is the Recommendation being voted on, then I'm fine with it as an additional view.

CHAIR FONTES: Got it. Carl, do you want to respond to Tom?

MEMBER POVELITES: That is my understanding as well.

MEMBER HATFIELD: Great.

CHAIR FONTES: Okay. Any other discussion? Karl?

MR. NEBBIA: Just a couple of questions I wanted to mention here. And we certainly appreciate the rapid work that was done on this issue. You were not given much time for a really significant issue, and we appreciate that effort.

With respect to Recommendation No. 1, I think it is critical to recognize we are, and have been since you provided them, engaged in using the LTE Technical Characteristics that you provided. But as it says here, it's critical to understand that these are available for initial interference-type analysis. That if we use strictly that data, then the protection areas or exclusion areas that we may have to use to separate existing government equipment from this equipment coming in can be fairly substantial. That, in fact, as we discuss this, all of the industry participants I think indicated that there are

things that they could do to make it better as you began to enter into that one-on-one or industry/agency dialogue that's described here. Just so you recognize, we have in fact used what you've given us and we understand that that is a beginning point and not necessarily the end point.

In Recommendation No. 2, you have highlighted the need for an informal process, obviously, through the CSEA, there's a lot of formal process that gets created. But we are interested in what the construct could be to provide for a legal informal process and one that included all the necessary participants. I mean, we know who the agencies are, but how would we get industry engaged in such? And I think we would like to come back to that in our request to you as we look at moving forward on recommendations that would come out on 1755, how would you recommend that we specifically approach that, in a way that gets all the necessary people engaged in that

discussion that's transparent, that's all those types of things? So, I think that's critical.

On Recommendation No. 3, the issue of staging the band is an interesting one because it's not clear in the presentation whether the idea of staging is due to the necessity or difficulties in moving government systems out or whether industry, you were representing in your conversation viewpoints and thoughts of industry as experts are saying that somehow staging the band in better for industry. So, if I were to come back tomorrow and say "We're ready to ante up the entire band," this sort of sounds like you're saying "No, don't do that. Give it to us in parts."

So, I'm not quite clear on whether the staging is for industry purposes or the staging was somehow meant to deal with the government's difficulties that you saw in transition.

And then in the last area, I think

once again, when we start talking about exclusion areas and defining sharing zones, I think that is a critical aspect that gets into this informal process. But I think one of the things to consider here specifically with this band is that, whereas in the last case we had a few individual services that had to be moved and the processes of moving them became fairly clear, in this case we've got multiple services, airborne services, things built into aircraft and so on. So it would appear that as you try to transition those types of systems, the transition itself is a period of sharing and that that construct really has to be worked through in some detail to understand how we're going to get there.

With that many pieces of equipment it's unlikely that it can be defined as an on/off, you know, here's the first band, the second band's off, and then here's the second band. It's not ones and zeroes, it's a transition of multiple different types of

systems we'd have to look at.

So as we consider these zones, even though we understand that the end goal is exclusive access, the transition might be such that we're going to have to deal with these concepts anyway. So we'll have to look more closely at what they'll be. But I think the key is pointing to a path for how do we get the right players together to go through this dialogue in a way that's legal and transparent and gets us to an end goal. Because we did have a challenge here with the LTE characteristics, and we said, well, can't you get us something better, can't you get us something that's more accurate to the bottom line? And nobody wanted to do that. They said, this is the best we can give you. We know that people can do better than that, but we don't feel in this forum and at this point we can give you a different set of numbers. So I think that process is going to be absolutely critical.

ASST. SEC. STRICKLING: Yes. I just want to punctuate a couple of Karl's points.

First of off, assuming you all adopt this motion, I'd like to be able to say this is the last remaining hurdle to getting our report out. We've just been waiting for you. But I can't.

(Laughter.)

ASST. SEC. STRICKLING: But the point that Karl makes is really important. Any of you who have looked at this band understand this is about as complicated a band, in terms of federal uses, as we have ever had to deal with here. And this process that we see happening that you're recommending in Recommendation No. 2 is going to be of absolute paramount importance to the ultimate successful reallocation of any or all of this band. And it'll also drive very much the timing of everything. So, there's, I think, a real challenge to the CSMAC here as well as

members of industry to come up with an arrangement that really has both sides at the table working hard, sharing all the appropriate information and working together to reach a goal here. This is just going to be of absolute importance to the ultimate success of whatever recommendation we're able to make in this band.

MEMBER POVELITES: I would just like to comment that we've been wondering or questioning what our next step would be once this recommendation is approved. So I think we now have maybe what our next item is that we'll try to address.

CHAIR FONTES: Very good.

MR. NEBBIA: Yes. We will not have another band, a specific band identified for a short time yet as to which one we're going to analyze next. But I think coming up with a question that specifically deals with what should be the construct of this informal process, who should be involved, how we would

deal with a service-by-service consideration of these activities, I think, is the crucial.

CHAIR FONTES: Thank you so much, Karl.

Tom?

MEMBER SUGRUE: Karl, just on your comment or question on Recommendation No. 3. I've addressed it twice now, so it's clearly near and dear to my heart. But the reason for the two stage, frankly, is the reallocation decision isn't self-executing and then it sort of has to be that okay, we need to find replacement spectrum, we need to do this, we need to do that. So, a reallocation decision, the whole 95 I don't think this is opposed to that, but the idea is that -- and you may disagree with this -- but this is the recommendation, that by leaving 70 MHz -- without having to deal with the whole 95 in one fell swoop and have to swallow that in one fell swoop, we can more rapidly make that 25 available for commercial use. And that

doesn't mean it's without challenges or anything like that, I'm not trying to say that's easy, just write that off. But that whatever the problems are for the whole 95, they should be more manageable if you leave the 70 in the band that would continue to be available and then we'll work on a longer term transition, both the agency, of course, and we hope to have the interaction of industry through this body and otherwise.

So that's the reason for the two stages. Not that we're saying "Oh, we don't care about the rest of the band."

And, you know, the reason the 25 is so important is it can be paired immediately. And by "immediately," I mean consistent with the law which is 18 months and so forth and so on. So, that's the rationale. Not trying to be mysterious about it, it's just that we would hope reallocation for the entire band, but immediate availability for auction, by "immediate", again, consistent

with what I mean by that, for the lower 25.

CHAIR FONTES: Right.

MR. NEBBIA: Yes, I appreciate that, Tom. And it sounds to me like you are saying you recognize the difficulties in moving out of a large portion of the spectrum and this may facilitate that.

I did have some questions aside from the hard recommendations as we get into it. I did want to call attention to at least my reading of it that there was an FDD orientation to the recommendations and the interests that are being expressed. Given the fact that one of the reasons why FDD is recommended is because that's what we've been doing and if you add TDD in around that, there's going to be interference from one band to another almost presupposes that we're never going to head toward TDD, even though in an asymmetric environment it seems almost like a better way of doing things. So, I am a little concerned that it does have that kind of --

you know FDD is the only thing we're really talking about for the future and it seems like sooner or later we've got to make some break there.

Also, there was a point here, once again, in this staging aspect on page 5. It says: "Avoid replacing equipment for short term migration from 1755 to 1780 up to 1780 to 1850." So, it sounds like you're saying there if equipment can be reduced in its total bandwidth just by its nature of operation, you're okay with that. But the idea that we're going to pay people, the government in this case, to convert their equipment in some way; new technology that makes it more efficient to pack it up above 1780 and take that cost as an initial step, ultimately that would then have to be redone again if we reallocate the 1780 to 1850, it sounds like you're saying "Don't do that. Do not transition equipment if you can't just compact it based on its current characteristics."

You're saying don't spend the money to transition the equipment into that band.

So, I think that is, at least for us, that's a critical point to understand.

Also, I want to note back in some of the discussions you do get into a few of the specific systems which I think will come up further in the actual dialogue.

We have found, for instance, with the air combat training systems that they do operate all the way across the band. They do have an up and down link, like your commercial systems do that have to be separated. They do have multiple users, all participating in the same time. So they've got to have each of their links separated from one another so that it begins to take up a lot of the bandwidth very quickly. And that those systems are built into current capabilities and would have to be essentially redesigned to move them. So that presents some particular challenges.

The conversion that's noted here

to JTCTS as far as we can find out is not a conversion of equipment that leads to more or less use of the spectrum. There are differences in the technology from the existing technology, but those changes were not developed by DoD for the purpose of reducing the amount of the spectrum they're occupying. That would have to be done under a separate item.

So, there are lots of those individual questions in here that we'd have to take up in that other dialogue. And I think it's very helpful that you've drawn attention to them, and we get into them as we go there.

Thank you.

CHAIR FONTES: So, looks like that little informal group will have its great opportunities for discussions.

Any other comments on this particular item? Okay. Hearing no further comments -- oh, Jennifer?

MEMBER WARREN: Can you clarify

what we're voting on?

CHAIR FONTES: Sure.

MEMBER WARREN: I did put a proposal for that Janice's comments be attached as part of what we would be adopting. There was a motion to amend the motion. And I just wanted to make sure, because that will affect what happens.

CHAIR FONTES: That is correct.

What we're voting on here is the recommendations --

MEMBER WARREN: Yes.

CHAIR FONTES: -- with Janice's, how many page, two page or whatever document it is, as an attachment to those recommendations, correct?

MEMBER SUGRUE: And the initial recommendations to be changed --

MEMBER POVELITES: Well, as a separate viewpoint.

CHAIR FONTES: Right. Right.

MEMBER WARREN: With associations,

right.

CHAIR FONTES: Right. With the recommendations.

Yes?

CHAIR ROSSTON: And we're amending the title.

MEMBER EPSTEIN: I want to get clarification of Jennifer's request for clarification. And that is, as I see it, because, as I say, these are good comments and they add color and texture, I don't think people around the table have seen them or digested them since they just showed up. And I learned about them this morning, quite frankly.

And so I think the proposal on the table is to adopt the report with the recommendations as amended, to clarify the title and adopt the report with Janice's attachment as additional views. And anybody who wants to associate themselves with those additional views, that's fine, that's

perfectly fine. But they at this point have the status of additional views.

MEMBER WARREN: So they would not be being adopted as part of the report as additional views, then, attached to the report?

MEMBER EPSTEIN: As I understood what our chairs have said, I think that's the proposal.

CHAIR FONTES: That's my understanding. I think you clarified it better than I did, actually. I probably caused more confusion.

MEMBER WARREN: So we'll be having two separate votes, is what you're telling me? I'm just trying to clarify. One for the report and then one to -- or not, to attach to the --

CHAIR FONTES: No, I didn't interpret it as two separate votes. I interpreted it as a vote on the recommendations with the amendment to identify

the specific band and to recognize alternative positions or opinions, or however you characterized it.

MEMBER CROSBY: Additional viewpoints.

CHAIR FONTES: Additional viewpoints associated with the recommendations. Is that correct? Anybody -- I'm getting nods from the Chair. So that is what the vote is about.

MEMBER SUGRUE: To the extent the additional viewpoints are inconsistent, and I don't know whether they are, I haven't read them myself --

CHAIR FONTES: Oh, Tom, you need a mic.

MEMBER SUGRUE: They don't override the recommendations in the report which everyone has had for the last three months. I think basically we recognize a distinguished colleague has some additional views that are of value, and so we want to

attach them to the report and I'm fine with that.

CHAIR FONTES: Okay.

MEMBER REASER: I'd like to make one suggestion. This is Rick Reaser. Can you put her name and the date on this thing, too? When the thing was sent, I didn't even know what it was.

CHAIR FONTES: Right. Yes, it just kind of appeared and wasn't sure until you read it where it actually fit in.

Okay. So everybody understands what we're voting on? Great.

All those in favor of accepting the recommendations with the amendment and the additional views? Thank you. Somewhere I'll remember that. All those in favor of this proposal say aye?

(Chorus of ayes.)

CHAIR FONTES: Any opposed?

(No response.)

Thank you for those on the phone

voting as well.

MEMBER WARREN: One abstention.

CHAIR FONTES: One abstention. Okay. Great.

And actually, Larry, I think this is the first official vote of a report coming out of this CSMAC to be submitted to you guys. So will you be reading that report later today then, is that right? We've got to have a little levity in the room.

Our next group, and actually --

MR. NEBBIA: Can we just confirm then the understanding of the second question?

CHAIR FONTES: Sorry. Sorry.

MR. NEBBIA: Just wanted to confirm -- or did you want to do that now or you want to do that later? I just think we need to confirm everybody understands the purpose then, the second question the group would deal with is to recommend a framework or a construct for having these interagency/interindustry discussions to move

forward on discussing transition sharing in this particular band. And not for this group to actually carry out all of those discussions, but in fact to recommend a construct for doing it.

CHAIR FONTES: I have been reminded to have everybody state their name, Karl.

MR. NEBBIA: Sorry.

CHAIR FONTES: So that is Karl that just spoke. So thank you for clarifying what the next question would be for this group. Any comments on that, Carl?

MEMBER POVELITES: Carl Povelites.

CHAIR FONTES: Thank you, Carl.

MEMBER POVELITES: That's be great, and we look forward to it. And if there is a possibility you can actually put it in writing of a question for us to look at, we'd be glad to address it appropriately.

MEMBER REASER: Rick Reaser.

The other group is actually

looking at this, so we may want to try to figure out that. The other group is like in a generic sense, not just for this band. In fact, we have text and stuff that we have prepared on that. So I won't take our subcommittee chair's thunder, but we have actually talked about this in the other group about the sharing, the sharing group.

CHAIR FONTES: Great. Thank you.

And this is Brian.

This may be an opportunity, then, for the subcommittee chairs to actually coordinate and to see what work is being done. Because there's no sense in being duplicative in the work effort.

MEMBER POVELITES: And once we get the question --

CHAIR FONTES: Yes.

MEMBER POVELITES: Once we get the question from Karl, we can have a discussion and see what the overlap is.

CHAIR FONTES: Thank you.

Okay. We're on to the next item, and we're actually consistent with our time frame for the agenda today. The next item is spectrum sharing, and we're going over to Larry and Mark. I don't know who is going to be the actual speaker.

MEMBER ALDER: This is Larry, I'll kick it off.

That is the right one. Thank you.

So let's go to the first slide.

So this is a preliminary. We're not submitting any recommendations for a vote today, so everybody can relax on that front. But we've attacking, initially there was a first question that we were working on, Question 4d of: how do we set up sharing arrangements when the primary service may continue to evolve?

We submitted a preliminary of that back in Boulder in July, and we've kind of now combined it with the second question which we feel as, after talking to Carl, perhaps the

more critical question of really "What kinds of sharing is workable for the industry in the long term?" And we've had a little sub-interpretation of that question: "What kind of sharing arrangements would be workable as part of this 500 MHz plan?" So I think that the NTIA is saying, if we got to deliver on 500 MHz, we think some of it has to be shared, what kind of arrangements would be workable as part of this plan? So that's the question we've taken on.

We've had very good participation. I want to thank -- I'd love to go through all the names, but we've had about eight or nine people that have been very active. It's been a very good discussion with a lot of broad representation of different interests from the carrier community to people in the defense community, et cetera, and the technology community. So I really appreciate all that.

We split the work into two threads recently. One was kind of: let's look at the

technologies that might enable us to answer these questions. And Mark McHenry has been leading that thread and has done a lot of good work that he'll talk about in a moment.

And then the second question really ties into what was just discussed, really a process recommendation, and I'll talk about that in a moment. Steve Sharkey has been helping pull together some ideas there, and we'll go through that.

Our goal with this group is not to come up with the one size fit all sharing recommendations. That's just a footnote here.

Let's go on to the next slide, which is the technology update. So let me turn it over to Mark, and he'll cover what we've been doing on the technology.

MEMBER McHENRY: This is Mark McHenry.

We've looked at several scenarios. And there's another document, which we probably won't go through, which shows block

diagram the different database approaches, sensing, integrated sensing and so forth. And we applied -- there's the applied diagram.

We applied them to different scenarios and again, no one approach fits all the scenarios. And so we see a lot of customization, depending on if the incumbent can change or the entrant doesn't want to introduce sharing some of his stuff, he wants a new database.

So then what we did was look at isolation analysis. If you have a radar, is the incumbent -- or you'll have a telemetry system, the distances or the isolation, you know per mile are very different.

MEMBER ALDER: Mark, it's just I see people flipping through their papers. Just for clarification, we have one presentation, the master doesn't have all. My understanding is there's a separate document that's attachment and on the website.

Sorry about that.

MEMBER McHENRY: So the isolation analysis really shows that the scale sizes between the exclusion zones -- between the entry causing damage to the incumbent or vice versa are very different. And we haven't come to a final conclusion what does that mean, and we made that notice.

And then we looked at the exclusion zones where, if you don't know the position of the entrant or the frequency, that's kind of what NTIA kind of proposed for the radar band, it's very inefficient. That would be the least attractive way to do that. It's easy to implement but it doesn't harvest much spectrum.

So what we're planning to do is kind of go through these different approaches and then compare to the scenarios and does this really make sense? And, hopefully, we can convince the rest of the Committee members that sharing would make sense and that the database for sensing for each two or three

scenarios: The satellite scenario, telemetry and radar so that it make sense.

So, by the next meeting I'll have more details and the technical buildup of that.

Larry?

MEMBER ALDER: Yes. So there's two reports attached, so we got the main slide deck. We've also submitted on the website two technical documents on the spectrum sharing approaches, and there's another one that has some detailed kind of linked budget analysis of what would be exclusion zones. And I drew a couple of conclusions for that that I'd share with the group, and it's on the isolation analysis.

You know, these exclusion zones look pretty large from just a -- you know, if you try to keep everyone separate and in their own corner so you don't have any interference. And so that points to trying to wanting to do something a little bit more clever than just

exclusion zones.

And then Mark has looked at a couple of scenarios for sharing. And I think the conclusion there is there's probably no one size fits all. It's probably dependent on the specifics of the band, the services, et cetera. But there's probably a way to do something better and more productive. So I think it's just a directional finding at this point that if you want to get better, you have to get more specific.

So that brings us to the next slide. When we looked at the question of what kinds of sharing are workable for the industry. We actually focused a lot in this interim period on the carrier community. There's multiple communities who would like to share. There's the carrier community, there is you have the public interest unlicensed community, there's entrants such as utilities. And we haven't gotten as deeply into, like, the utilities sector or the unlicensed sector.

We spent some time talking about the carriers and had some good participation from a couple of carriers.

And one thing is clear that's going to be no surprise, is that the commercial carriers preferred statuses to get cleared spectrum. That is their preferred status. It's not to say there's no desire for sharing. I think there's a desire to sharing, but they don't want to compromise the ask for cleared spectrum. This presents a challenge, and I think we have to face that that's a challenge.

In a forum like this, having a detailed question asked of them well how would you share, how would you be willing to share, it's difficult for them to address that question without compromising their request for a cleared spectrum.

So again, our insight was that there needs to be a process to engage in a more specific manner and address the

challenges, including the information challenges to figure out what technologies, as Mark's been saying, works for sharing he needs to or the technologists need to know more details about the incumbent systems, et cetera.

So we decided to look at a set of process recommendations as well as the technical recommendations. So we can go the next slide.

So these are, again, preliminary. And I want to represent them as preliminary and don't even reflect the full consensus of the subcommittee; so these are just mid-discussion. But we wanted to put them out there. Again, these are more focused on the carrier community in the discussions we've had.

So, the first recommendation is when you can't clear fully, the analysis should be undertaken to determine what the impact of those federal systems that remain in

the band would have on the commercial users and what sharing conditions are required to protect the incumbent systems.

The second one: This analysis could be best accomplished through the establishment of a joint government/industry technical committee to address the specific opportunity. So much like we talked about earlier with the 1755 Committee, here we're saying we're going to need to have a joint industry working group to address the specific opportunity that's at hand. And I think that's key language here, not general sharing but the specific opportunity.

And so, again, we're going into on the next recommendation: The establishment of a government/industry advisory does not have to be overly burdensome, it can be treated in a way that will protect the sensitive information. The parties involved in the discussion can be limited to a focus group of experts and it may even include non-disclosure

agreement to protect sensitive information and to facilitate the exchange of information ideals that lead to a preferred solution for all parties.

And of course the final, all the rules and final decisions would have to be subject to a full and open public rulemaking process.

So I think the general comment, and we can have other people give their interpretation, but my interpretation is that there needs to be a process where some sensitive information can be discussed in a way that works, drives to a conclusion, that has the right parties involved. It's not a general discussion, it's specific driving, it's specific band or set of processes.

So, I'll just wrap up. So the goal of the Committee is to really refine these over the next period and come back with something that we can bring to a vote and approve. And we're going to try and

consolidate it into a recommendation in each of the following areas: The technology and the process. We're going to try to -- Karl's really like I just want one recommendation, don't give me 15.

So that's where the group is. It's been a good discussion.

I've attached in the appendix here. This was shown last time, but the next slide I think is the more interesting one. This is one of the slides that you'll find in the sharing analysis that Mark did that actually gives kind of a separation distance analysis that you have to have just based on linked budgets. And again, this is just Mark's preliminary but you can see you can get some feel for the types of separations that might happen.

With that, I will turn it back over to the chairs or if there's any other subcommittee members that want to comment out as well.

CHAIR FONTES: Okay. Let's just find out if there are any subcommittee members first that wish to provide additional. Mark?

MEMBER McHENRY: One of the recommendations that we didn't talk about, but we provided a database system where NTIA or the DoD would give position of ships and frequencies. I mean, some of these might be thrown out. We could save a lot of time if NTIA would look at some of these. You know, we kind of went over once the list of sharing approaches, rule some of them out right now. This wouldn't be too hard, or give us some more feedback would be very helpful.

CHAIR FONTES: Any other comment? Any comments then from, first Gary and then Jennifer.

MEMBER EPSTEIN: The question about sharing of information, are you talking about proprietary information or confidential top secret information, or both?

MEMBER ALDER: This is Larry.

So I don't know the answer to that question, but there's a recognition that sensitive information of some type probably will have to be shared in order to design the most productive system. So there's a recognition that it may not be possible to do that in a wide open way. There might need to be ways with agreements and such so that that information can be handled.

Mark had talked about drawing an analogy to the Defense procurement process where sometimes there's sensitive information that needs to be done and vendors have access to that.

So it's just an overall recommendation that there is sensitive information that might be needed to share in order to design the most productive sharing mechanisms.

MEMBER McHENRY: And the sample to help to applied telemetry in -- that's really important.

CHAIR FONTES: Jennifer?

MEMBER WARREN: Thank you. Jennifer.

I just wanted to echo two things that Larry said. One is that it has been a really diverse group of members in the subcommittee and, hopefully, it will continue to be that way. But that it is also very preliminary

I think, you know Larry has chosen one of the process discussions that we've had, but there's been multiple threads. So what the actual process recommendation will look like may or may not bear any resemblance to these exact details. So while this is a good preview of the nature of our discussions, there are multiple threads going on.

MEMBER ALDER: Yes. Thank you, Jennifer for that. That's certainly the case.

CHAIR ROSSTON: I actually had a question for Mark. You know, not being an engineer I looked at the different systems

that you had drawn in the back of your slides, and just to clarify what I got out of this, and if I'm right or not. There are lots of different systems and that this would give you lots of different possibilities for ways you would share a response to what the different systems are? Is that the way --

You should take a microphone.

MEMBER McHENRY: It all depends on what the entrant and incumbent are willing to do. And if the entrant is willing to put sensing near the handset, that's one approach. But he might not want to do that. And the incumbent would provide the location of frequency of all the emitters real time, that would be very easy for the entrant. So, until you weigh the difficulties for each side, it's tough to come up with an answer.

CHAIR ROSSTON: So those just illustrate different types of sharing arrangements that might work.

MEMBER McHENRY: These are the

four ones I could think of. I think they almost -- I want to say span in space, but they somewhat spans the space. The answer will be one of these or a combination of these.

CHAIR FONTES: Michael, did you have a question. You're going to need a microphone.

MEMBER CALABRESE: Yes.

CHAIR FONTES: Your voice is distinct. Michael Calabrese.

MEMBER McHENRY: Yes. Michael Calabrese. And I'm a member of the subcommittee.

You know in the spirit as being preliminary, I think we also have some work to do in more explicitly thinking and talking about more low power sharing scenarios. Because I think, you know the work done so far was sort of explicitly from a carrier industry perspective. And so you'll see a lot of things had that caveat on to, like the industry perspective, this/that; we're

referring to the high power people. And I don't know if we need an additional question from Karl or not, but I think a lot of the potential is going to be on bands where, you know we're not talking about minor exclusions, we're not talking about federal users vacating but we're actually talking about sharing long-term and probably most efficiently at low power. And so we need to be able to talk about local area, low power, low site as a form of sharing that could be very efficient and different than I think where our focus has been.

CHAIR ROSSTON: So I saw Mark shaking his head.

MEMBER McHENRY: Well, the technical analysis treated the high power and the low power systematically. So the technical, we did do both. The linked budgets have an unlicensed and they have a license, so we did do both in the technical analysis.

MEMBER CALABRESE: So the

scenarios could be applicable to either?

MEMBER McHENRY: We tried to evenly do both; licensed and unlicensed entrants.

MEMBER PEPPER: This is Pepper.

But unlicensed doesn't mean -- Michael's about low power.

MEMBER McHENRY: Well, the unlicensed scenario I had was low power.

MEMBER PEPPER: That was the assumption?

MEMBER McHENRY: Yes.

CHAIR FONTES: Okay. Are there other questions or comments from CSMAC members to this working group or subcommittee so that they can consider your comments and questions in their deliberations?

MEMBER REASER: This is Rick Reaser. I'd make one comment.

The one idea about the process thing, though, that would be something to get some feedback on. And something like that is

just acceptable to NTIA because that represents kind of a departure between my experience of how this has happened over the years. Typically what happens is NTIA defines something, the Commission goes out for rulemaking. The idea here is to try to have discussions before that ever happens with the affected parties in some way that there's a better understanding of what goes into that rulemaking. And that's the issue of the nondisclosure or some other way to exchange information before you actually go out for rulemaking and have the actual participants who would be affected, those who are trying to either buy the auctioned license or buy the license by auction or giving up or sharing, that they would have discussions beforehand.

In the past what's happened is after that process is all done, then the technical discussions start about, okay, how fast can you move, how's this going to work, how we going to share; that kind of stuff.

So because that's a nonstarter, because that's one of the things that was talked about and I think that gets back to what Jennifer was talking about about our recommendations may take a different turn. But the idea was to try to somehow have more information exchanged before you actually went out for rulemaking. And that was that big paragraph in the process thing.

MR. NEBBIA: Yes. This is Karl Nebbia.

Yes. I appreciate that idea. There have been, certainly, a number of cases where we have in fact done that type of thing. We had a case recently where there was a lot of dialogue between one of the companies promoting a particular type of medical device that was intended to operate in an aeronautical telemetry band. A lot of discussions went on between the industry people and the government and other aeronautical telemetry folks to try to reach

a conclusion on something that was workable as opposed to just doing battle by paper in filings at the Commission, that sort of thing.

So I think that we've certainly approached that in certain limited constructs where we had a specific user wanted to identify an opportunity in a band. It's a little bit more challenging if there's a broad range of users and federal agencies, and different types of activities on our side. But we are still looking for how we can create that construct before you get down to the final steps of the rulemaking process and so on.

In terms of how this connects with the previous group, I think we are looking specifically and asking. The subcommittee looked specifically at the 1755 to 1850 activity because the players change, the construct may change depending on which band that you're looking at.

I did want to draw attention to

the fact that, although the group as they've looked at this focused more on the sharing approaches that are workable for industry for the long-term, and I think they were right in approaching it directly as to how will we deal with that kind of high power industry as opposed to the low power unlicensed primarily groups. We were treating that primarily in I think the unlicensed discussion. So I think they're right in looking at it in those terms. Because as the President has laid out, the search for 500 MHz we're looking for both types, but of course we are trying to find spectrum specifically for the commercial wireless industry as opposed to unlicensed. It's not that we're not looking for both, but we are looking for those aspects. Certainly at 1755 to 1850 we're looking for a way that we can make that spectrum available for the commercial wireless industry. So, I think that's a correct approach.

But in the long run we don't want

you to lose sight of the first question that was on the table that sharing and how you do that in a construct where the equipment is evolving, the incumbents are evolving. The idea that we're going to ask to share spectrum and say you tell us exactly what you look like and do not change what you look like because if you start changing, then our sharing arrangement isn't going to work anymore. That is an anathema to the existing users of the spectrum to be told sharing is all about locking them in and then everybody else operating around them.

So, we do need to deal with that question. It's one of the major conflicts right now on the 5 gigahertz wi-fi issue because the FAA wants to change its radars over the long run. So it is a critical component here and I don't want to lose sight of that.

So, as we go forward and you break out the different environments and constructs,

we're certainly happy to participate in a way of telling you as much as we can. But, for instance, a real time database-drive process of all of the federal assignments that include the classified assignments is not possible at this point. And it is important if that's what you're trying to base on a recommendation on. That is not possible. From a security standpoint we cannot link classified databases at this point with any type of public interaction. It doesn't mean that we can't come up with a way of having discussions about how we might share spectrum, but ultimately those decisions about how they interact with people who would have to have a need to know is in the hands of the owners of that information, whether it's DoD, whoever it happens to be. They have to reach a conclusion that the industry has an actual need to know that information in order to include it in the dialogue.

So, those are just my thoughts at

this points. We appreciate you're still midway down this course and we're happy to talk more about the approaches that you're suggesting. But they are kind of band-by-band. The processes and people vary. But ultimately whoever the incumbent is, whether it's a federal government agency or a commercial entity, I believe they're going to be asking for some sort of ability to evolve and to change who they are as opposed to finding out that we fit the shoe so tightly that there's only one Cinderella that actually gets to go to the dance.

CHAIR FONTES: Let's hope the dance is over noon or midnight, I don't know if I want to see the consequences.

First Gary and then Michael.

MEMBER EPSTEIN: You know, this of course, it's obviously not a new issue, but I think I want to state something which we probably all understand. But there are at least three separate constraints when you try

to invent one of these processes.

The first one is the commercial confidentiality aspect of it.

The second one is the classified aspect of it.

And the third one is the legal process aspects of it. Sunshine, you know, participation, ability to withstand appeal. And so you have to thread your way through all three of those things in order to invent the process here.

CHAIR FONTES: Michael?

MEMBER CALABRESE: Yes. I had a question for Karl.

This is Michael Calabrese.

Yes. Certainly when you think about the governance database that the FCC established, for example, for unlicensed access to the TV bands, so there's ten commercial operators of those databases and there was kind of a purposeful effort to make the inputs transparent because it's almost all

complied licensing information that you could find at the FCC anyway.

So, I guess my question is why would classified database information necessarily be given over to the commercial sector or made publicly available, or even given to the FCC as you seem to assume, why couldn't the federal government, the NTIA for example, simply manage that as a black box that's connected to the commercial database, if necessary or is simply the direct place to go. So all you get is answer: I'm here, can I use this frequency or not. And there's no classified information revealed.

I think that's been the assumption that people working through these issues at the FCC and so on had made, that that's how the NTIA and the Federal Government will be cooperating with spectrum efficiency down the road. So I'm wondering why you think that's impossible?

MR. NEBBIA: This is Karl Nebbia

again.

Long-term it may not be impossible, but currently the security construct is we cannot attach a classified database to any type of direct outside access whether it's a matter of querying without seeing the database or not. Because the people in the IT world are very smart people and the security folks have determined at this point if you give them access, a way of connecting, though for the common users you will just put in your input, you'll get your output, for the smart IT person that gives them an avenue into the data itself. And at this point, we're not able to do that.

The 70, 80, 90 gigahertz database that we have constructed and operates in this way and operates well, was able to be constructed because we had no classified in those frequency ranges that we would have to protect.

So it puts you in a place of

creating an arrangement where you could take an air-gap approaches where maybe you get your answer back tomorrow as opposed to today, because we would have to take the data, the incoming request, download it into another system and upload it back. That always has its own security issues, but that would be one way. And it's not real time, and that was the connection that I was making. There are ways of nonreal time that we might be able to do it. Once again, you have to come up with the system to operate it and so on that would make sure that no of the wrong data flowed in and out. So it can be done on that basis, but right now we've been told that we cannot connect the classified database to an open access.

CHAIR FONTES: Mark?

MEMBER GIBSON: Yes. This is Mark Gibson.

I wanted to comment on what Michael and Karl both said. Yes, the 70 and

90 gig is an example, I think, of what Mike was talking about. And so no classified data is exposed, but it is a process where the data are sent to NTIA and an analysis is run independent. But there's another process that's similar with sort of this air-gap that you're talking about, and that's the portal that DoD established for doing coordination with classified systems with AWS at 1.7. That's got a bigger gap and the turnaround isn't quite as quick as for the 70 to 90. But carriers submit their coordination information. JSC, Joint Spectrum Center, does it on behalf of DoD, this analysis. The analysis is bifurcated into those that operate for classified systems and those that operate for nonclassified systems. And answers are given in bulk, if you will, yes or no specifically for the classified systems.

So, there's processes in place that respect the integrity of classified data, or even data that's FOIA exempt yet still

allow carriers and industry to interface with that information.

And the portal concept, you know while someone under the radar screen has worked very well. We've interacted with it a lot. And once we got some of the bugs worked out, it's been very streamlined and very, very well done.

CHAIR FONTES: Okay. Are there any other comments? Great. So we encourage you to continue working on. I hope at our next meeting we'll have some specific proposals to review. You know, this one area is particularly challenging. So I appreciate the amount of time, energy and effort going into this.

Great. Now I'm going to turn it over to Greg.

CHAIR ROSSTON: Great. So our next group is the Unlicensed Spectrum subcommittee's. And assuming that that's Michael since Janice is not here. So, Michael

Calabrese, go ahead.

MEMBER CALABRESE: Okay. Yes, unfortunately Janice had a conflict and sends her regrets. But I will walk through.

So we have a document with some draft recommendations. So this is still at a stage where we are welcoming feedback and refinements and additions. And right now we're focused on getting finality on our question, this is kind of our main question, number 1, concerning enforcement issues. And, actually, some of it speaks very much to the problem that Karl was talking about, at the end there, about concerns that federal systems have.

So, I can just walk through these five recommendations and then we'd welcome some discussion or, obviously, input then as we go ahead with our process.

So this is on basically the first two pages here of this document. Then the rest just goes into these same things in more

detail.

I should also note there's appended two case studies of the garage door opener situation and the Doppler terminal weather radars that created the issue in the 5 gigahertz band, just for illustration and because some of this speaks directly to situations like that.

So Recommendation No. 1 is fairly broad that to the extent possible, NTIA should put in place regulatory requirements coordinating with FCC that reduce reliance on post hoc regulatory enforcement of interference by turning more increasingly to technology-based solutions for connected devices that are prophylactic in nature. Because so far we're very much in a post hoc enforcement world still. So that's the generic.

And along with that going forward, the federal devices, devices for federal systems, should be connected devices as well

to the extent possible so that essentially everybody is in communication, you might say, and not untethered. And, in fact, that's kind of a major distinction in general we're making here between untethered devices which has been the history so far of unlicensed. Most of what's deployed right now in 2.4 and 900 MHz, you know be it baby monitors, garage door openers or wi-fi, are untethered and sort of -- - unconnected and then connected devices. They have all sorts of ways of dealing with changes in the environment.

Recommendation No. 2: Is to require that in most new unlicensed or shared bands, unlicensed devices should be connected devices that are required periodically -- I think this was Kevin Kahn's term -- to call home, that is either through a database mechanism or directly to the manufacturer. And this can be for a variety of purposes, for example: To obtain a firmware upgrade; to be remotely disabled on a particular frequency;

to renew permission to access a frequency; or to receive direction to move to another frequency. And again, this would probably be determined on a band-by-band basis what was necessary to share with, you know whatever primary system's already in place since it would be, I think, somewhat unprecedented and then unusual for unlicensed bands to be dedicated and only that. So we are anticipating a sharing scenario.

Under the scenario, the burden of interference mitigation would be shifted primarily onto manufacturers to rely on technology solutions rather than on consumer education which does not seem to be very effective given the incentives.

So imagine the case of the garage door opener, perhaps in the future, or systems like that where what the Air Force could do is the Air Force could contact NTIA, have them transmit a beacon that would cause all the devices to call home, to contact the database,

get an automatic firmware upgrade, problem solved, ideally.

Recommendation No 3: Is that in cases where avoidance through technology measures fail, we would recommend that NTIA again in coordination with FCC, recommend that the FCC strength enforcement measures to provide stronger deterrence and that NTIA should also educate policymakers concerning the secondary status of unlicensed devices and their obligation to accept interference.

So, to this end the Committee has also, I think, largely embraced or wanted to bring up again the recommendations in the CSMAC Interference Committee report from last year that had some these very things, such as: A streamlined interference reporting mechanism; increased penalties; a shot-clock approach to responding to interference compliance; remote shutoff as an option where the band is sensitive. So those are the sorts of things that actually were already discussed

in the last CSMAC and would be relevant here.

Proposed Recommendation No. 4: Is in cases when it is not a matter of unlicensed devices intentionally operating outside of the rules, but you still get interference because, you know, that certainly will happen that manufacturers should increase consumer education efforts as an important backstop to enforcement and avoidance through technology efforts. And, you know it could be that industry coordination efforts are done more proactively in advance so that, for example, what ultimately was a big help in the garage door opener situation we found was that in the aftermath of the problem, NTIA established a working group that got industry to agree to offer a retrofit kit to consumers to help solve the problem. But, you know, perhaps if that sort of thing had been set up in the advance, that backstop could have been arrived at even more quickly.

Recommendation No. 5 is that NTIA

in coordination with FCC undertake further study of the regulatory treatment for so-called cheap, dumb devices. And here so far all we've really done is raised some questions.

Should cheap, dumb devices be segregated, you know be limited in other words to operation on a couple certain bands, such as the legacy 900 and/or 2.4 gigahertz bandwidths where they will certainly be in place for a long, long time or should policymakers move to phase them out completely, such as by setting a deadline at which time, you know, you cannot sell anything with those characteristics either in general or other than in one particular band?

So, on the one hand, and I'd just throw this out because I can see people already thinking of the downsides. You know, one the one hand this obviously could increase costs, which we've talked about as could be considered as a necessary user fee that should

deter innovation. In other words, we're talking about efficient access to open spectrum, and yet if the need to make that make sense is more expensive equipment, you can regard that as a kind of a necessary user fee.

On the other hand, then we have consideration of things like the internet of things, right? The projections of 50 billion devices being connected to the internet by 2020. Certainly a huge proportion of those should, I would think, be unlicensed spectrum. And so connections like remotes for remote sensing, we would not want to make those overly expensive or complicated. And so that would be a consideration in terms of whether you would reserve certain spectrum for that purpose or require that they be somehow be connected devices themselves.

So, that last recommendation is not really a recommendation so much as it was a recommendation to really seriously consider

limiting this, you know these unconnected devices in terms of where they would operate. Because they do create complications for sharing the bands.

So, I will stop there and welcome comments.

CHAIR ROSSTON: Okay.

MEMBER CALABRESE: Any other members any comments or questions?

MEMBER COOPER: Well, Michael, should there not be a recommendation that encourages creation of new technologies that use the unlicensed band in more efficient ways to actually replace --

MEMBER CALABRESE: Marty, I didn't hear the end of that. To replace what?

MEMBER COOPER: The suggestion is that ultimately, I know you're talking about a long-term viewpoint, and ultimately I believe that all activities in the spectrum are going to need a license. And so we ought to be encouraging the creation of

technologies that moves towards that direction.

MEMBER PEPPER: This is Pepper.

Marty, I think that one of the things that we talked about in the group was that when we're looking at unlicensed devices, low power in combination, almost by definition they're either going to share with themselves or they will share with primary users. And the question going forward using technology, especially in the cases of sharing spectrum with current government uses, would be to have the device connected for all the reasons that Michael talked about. So, smart enough to be able to know when and where they can operate and addressing the issue that we talked about in the shared spectrum, a question of the flexibility and agility of existing users to provide these services going forward, right? And then the ability to update the unlicensed devices operating low power and share.

I think this addresses some of

those questions as well, Karl.

Marty, in terms of going forward, I mean again so your vision of nothing will require a license because everything's going to be smart enough to know when and where it can operate. I think almost by definition presupposes the type of connected device that we're talking about so that there can be very adaptive networks. I mean, that is off in the future, but in this context as a small step in that direction what we were trying to do was identify bands, a spectrum that could be used to create a whole new service platforms, whole new industries to take advantage of the existing unlicensed technologies but do it in ways and on frequency that to date we couldn't do that because there are other users. So it's a different way of thinking about sharing. This is where, Karl, the sharing and the unlicensed comes together and how we try to address that.

On the last question or

recommendation, which is really about the dumb device, cheap-dumb. Cheap-dump, actually the definition of that is unconnected, right? So it can't be updated and the question there is when we are talking about very, very small devices in an internet of things in which the cost of the device is going to be very small, very low, there's some benefit-cost questions. And there was no consensus within the group as to whether or not we should adopt a recommendation that everything should become smart and connected in the future. In fact, there was a lot of discussion that actually it could lead to some very adverse consequences if we did that, especially since we already have bands that don't have that. So really we can think about this as a migration strategy to find new bands and frequencies for low powered unlicensed shared devices and then there's some things we can do to the existing bands to make them more efficient. But the fact that intelligence now can be embedded at

very low cost in devices and when they're connected, almost by definition, they're radio devices so they're connected to something, provides a wider range of tools to avoid interference and so that they work together.

CHAIR ROSSTON: So after I stop buying the expensive dumb devices that I seem to buy.

MEMBER TRAMONT: I just wanted to make sure that the institutional observation, which is the charge of this subcommittee was the enforcement question and sort of how do we deal with it the four very specific questions around enforcement? I think the strength of the model that's been adopted by the new co-chairs has been the narrowness of the questions presented. And so I think Marty's observation about the long-term future and the need for additional efficiency is important, and I think it's been talked about, but I think we need to sort of keep our eye on the enforcement ball here. And I think that some

of the recommendations here make good progress on that. But this enforcement question is one that has vexed us repeatedly over the course of the last four to five years that we've been working on the Federal Advisory Committee. And I want to make sure and just urge the Committee to stay focused on that sort of relatively narrow operational question about how to handle enforcement across the four vectors that Karl identified.

CHAIR ROSSTON: I'm going to step in. This is Greg.

I've sort of been following along on that. And we're here at NTIA, not at the FCC, so we're trying to think about unlicensed devices that would work in federal government spectrum not in unlicensed spectrums. So we sort of want to focus on rules that at least for some period of time would be in the Federal Government spectrum it's possible with the unlicensed devices that operate in federal government spectrum or the Federal Government

agencies may ultimately leave the spectrum, so we may set the road path for that. But for right now we're thinking of it as unlicensed devices and how they would interfere or not interfere with that. Just to sort of set that as one of the big picture things that we're thinking about along with Brian.

MEMBER CALABRESE: Can I clarify something? Just because it's right on Greg's point is that I should have been more explicit. But we consciously considered I think the problem that Karl raised earlier during the discussion on Sharing Committee, which is the one, you know he also mentioned was that issue with the FAA and the Doppler radars, which is enforcement also in the context of, you know typically these scenarios both the garage door opener and the terminal Dopplers that the situations arose in the context of unlicensed device sharing with federal users on federal bands where federal use was primary. And so we're very conscious

of a way to not only promote to facilitate more sharing but also to avoid the concerns would be to have devices that could evolve as the federal users evolve. And so that was an explicit part of the equation not going out so much the long-term, this is as Bob said a step in Marty's direction, so it's consistent with where technology is going. But it's more explicitly to address the needs of the federal users to allay their concerns on both enforcement and on hearing just generally.

CHAIR ROSSTON: David. Well, David and then Jennifer.

MEMBER WARREN: So it is true; if you have the mic, you have the floor.

Just a couple of quick comments. First, I think this is great. There's a lot of really great thinking. It's really important, given as Brian said, this has vexed us in the sharing discussion for so long.

I have one specific point in terms of the narrow question and then two sort of

larger questions I just wanted to bring to the group.

One is was there any discussion in the subcommittee on recall authority, the ability to actually recall equipment? I know that in the context of a particular sharing problem between unlicensed and a license service at the FCC, one of the challenges that the FCC had they stated was that there was no authority to recall devices that were currently on the shelves being sold that were demonstrably causing interference to the licensed service. So I just throw that out, whether there's been any discussion and then I'll just make my other two points.

MEMBER TRAMONT: Okay.

MEMBER PEPPER: So not recall specifically, but the ability to turn it off?

MEMBER TRAMONT: Yes.

MEMBER PEPPER: So the question is whether disabling --

MEMBER WARREN: That's for the

smart device.

MEMBER PEPPER: -- is the equivalent of recall, but not recall per se?

MEMBER WARREN: Right. And that's for the smart devices. And I think you said you were talking about both dealing with the smart and not smart devices. I think the question was there a discussion with respect to the dumb devices? So, I just would throw that into the subcommittee to perhaps think about.

Two, I'd like to ask a question on Recommendation No. 2 and whether or not the ability to call home I think you contributed to Kevin would begin to address the issue of whether the incumbents have the ability to evolve. Will requiring the smart devices to call home and make some changes somehow start to address evolution for the incumbents? Is there a way? I mean, do you see that in there?

And then my third point is, do you

think that structuring some of these recommendations would also then provide incentives for manufacturers to make this investment in smart devices over dumb devices? Because there's access to spectrum that's probably more guaranteed in the long run for their product than for the dumb devices. So there's a whole competitive incentive here versus manufacturers that choose not to. Perhaps we ought to draw out that this could be an incentive structure as well: Just a thought that some of the recommendations could play towards that.

CHAIR ROSSTON: David?

MEMBER DONOVAN: I only have two. That's always dangerous.

Thank you, Michael and Bob for a terrific report.

I just have one question on the enforcement side. As I read through the document issues regarding enforcement seem to be focused, as they should be, on the devices.

I mean, what happens if the device doesn't work or things of that nature. Did you subsume within that analysis what would happen if the device was functioning perfectly but was relying, for example, on a database and the error occurred not in the device or in the manufacture, but in an independent third party database provider to the extent we use geolocation in sharing with NTIA?

Now, obviously, it's a different issue you use sensing. But if you have a third entity, and let's assume it's part commercial that is sharing with NTIA and the devices are fine, but the information being provided to the device somehow is off. Should we at least maybe just expand a thought or two how one would deal with the enforcement of sort of a data-based entity with a database has gone wrong? Just a thought. Otherwise, I think it's a terrific report.

MEMBER CALABRESE: I don't think we discussed that explicitly.

MEMBER DONOVAN: Right.

MEMBER CALABRESE: It would be worth mentioning. I think on one hand it would be an assumption that that would be built into the authorization process.

MEMBER DONOVAN: Right.

MEMBER CALABRESE: You know, some sort of process for dealing with those situations.

MEMBER DONOVAN: Sure. Right.

MEMBER CALABRESE: On the other hand, it's worth mentioning that that's a potential hazard.

MEMBER DONOVAN: Right. And how you would fix it. Because it's entirely possible and if you're dealing with enforcement and you guys go into wonderful detail, terrific detail on what the responsibility should be for devices. And the thing that caught me was one of your recommendations that said: "What happens if the device is working perfectly but you still

have interference?" And that triggered this scenario is what happened if I'm a consumer, I've purchased a device that's working fine, but the data is coming from a third party entity and that's wrong. And that raises a whole set of different set of issues, particularly if I'm doing combined sharing with federal systems. So it may require some thought.

Otherwise, terrific. Thank you very much.

MEMBER CALABRESE: In that report, can I just ask him -- that report? The Interference subcommittee report last year --

MEMBER DONOVAN: Right.

MEMBER CALABRESE: -- was it addressed?

MEMBER DONOVAN: You know, I think we didn't focused on it. We raised issues regarding you can avoid interference with a database approach. We raised interference with using sensing and these are some of the

enforcements. But now that databases have become more real, and certainly the Commission has moved on, and the idea that you may have an independent third party database or multiple database providers I think raises the specter of that issue that really should at least be considered.

MEMBER CALABRESE: Okay.

CHAIR ROSSTON: Harold?

MEMBER FURCHTGOTT-ROTH: I also want to commend the chairmen for framing these issues so well. A lot of progress has been done in the subcommittee.

I think some of the discussion this morning has reinforced some concerns that I raised in the subcommittee before and I just want to bring those up to the full Committee. And that has to do with what I might describe as international coordination, in some sense.

The United States has been the leader in unlicensed devices, but today I would hazard a guess: The vast majority of

unlicensed devices are manufactured outside the United States. And going forward if you were to look 10 years from now, 20 years from now, the vast majority of the consumption of unlicensed services around the world will be outside of the United States and our ability to influence the structure of unlicensed devices in what is an entirely global market for devices and device manufacturing is going to erode, and erode very quickly over time. And we already see this.

We saw this with the wireless microphone situation over the past few years. We had absolutely no idea how many wireless mics there were. They were manufactured and used in a global market around the world and it was very difficult to get a handle on the interference that they were causing, not because of any shortage of understanding of the problem in the United States, but it was that these devices were used around the world and they would come into the United States

without a lot of difficulty.

I don't know the answer is to this. But I think if we're going to have some effective enforcement mechanism for unlicensed devices, it's something that we have to consider beyond just the United States. This is a larger issue than that. And we can do an awful lot here in the United States, but if other countries have a different approach to unlicensed spectrum, we won't have any ability to change that. And it's particularly true on the cheap devices of which there is just a enormous proliferation. They cost pennies, they are attached to every device that we have and there's a potential for a lot of interference from those as well.

CHAIR ROSSTON: Mark?

MEMBER GIBSON: This Mark Gibson.

I'd like to make a comment to David's point that he made a little bit ago about databases, I guess in the white space context right now, but ultimately as they get

more capable. Actually, two points.

One is that at least that at least under the current construct the data in those databases is provided by the federal authority. So, you know there's very little that can be done to make that data any better within the confines of the regulations.

Now having said that, our subcommittee is addressing how to improve data, so stay tuned. However, it does make a point because as the use of databases we hope proliferates, what it does mean is that there needs to be a priori considerations put on to make sure that data are as accurate as possible before the databases are made live.

So, I think it's a very good discussion to have and it sort of dovetails with what our subcommittee worked on. But I think in the commercial context, again as those databases proliferate, a lot of work needs to be put on up front on how to make those databases more accurate.

The other thing I wanted to comment was on enforcement. And this is odd because the Commission is actually now using the databases, at least in the white space construct, for enforcement. And so what these databases will be doing, based on the Commission's procedures, and I'm sure they'll be following full administrative procedures for issues, that the Commission will go through the databases. And actually the databases administrators will be the ones responsible for this shutting down classes of devices, areas of device operation and even specific devices. And I don't know that the Commission has any capability of doing that anywhere without using databases.

So, I think there's some implications there that would keep me up at night, and they should be keeping some other folks up at night because we're now bounty hunters, to some extent. And I don't have a problem with that, but there is some policy

implications that I think that this is beginning to scratch the surface.

And if you can do that with unlicensed, and provide interference rights of unlicensed devices against other unlicensed devices through the use of a database, then the issues for enforcement really need to be examined.

CHAIR ROSSTON: Dale?

MEMBER HATFIELD: I just want to say, make sure I'm clear, I thought the discussion of somebody was operating legitimately but interference still results was the case where if you have a poor receiver besides you and so you're producing intermod or something, you're operating perfectly legal but the interference ends up in someplace else. And the issue there, of course, then becomes whose responsibility is it to fix it?

If we have real interference but the people are operating legally, I don't know if that was the intent or not, but that's what

I took.

The other comment I had, more of a question. I should know the answer to this. There are non-communications devices that are used in these bands, and the classic of course is microwave ovens. And it wasn't clear to me what you do about in these new bands would those kind of devices be outlawed? And if they would be outlawed, on what basis would they be outlawed?

If I remember right, at least 900 was used for some pretty exotic things at one time that had nothing to do with communications. And whether that's still true, I don't know. But it's something maybe to think just a little bit about.

MEMBER CALABRESE: Isn't it also where 2.4 got its name as being junk --

MEMBER HATFIELD: Yes.

MEMBER CALABRESE: -- because it wasn't intended for comms, right?

MEMBER HATFIELD: Yes, in fact if

I remember right, this was a long time ago, is the industrial plastic melting thing --

MEMBER CALABRESE: Oh, sure.

MEMBER HATFIELD: -- and things like that that was not --

MEMBER CALABRESE: Right.

MEMBER PEPPER: That's why it was called industrial thing.

MEMBER HATFIELD: Yes. Exactly. Good point. Anyway, it's a small point, but we have not ever talked, that I'm aware of, about noncommunication devices and if they would, they would be basically be outlawed.

CHAIR ROSSTON: So I want to just take a couple of quick comments. I think we've had a lot of discussion, but there's time for a couple of more quick comments before we want to try and end on time for our next session on the agenda.

MEMBER CROSBY: I'll be brief. Mark Crosby.

But we're talking about sharing

the Federal Government bands here, right?

MR. NEBBIA: Well, there's so few Federal Government bands, I mean that may be true for some of the spectrum.

MEMBER CROSBY: Then, Karl, then you're answering my question. Because if the issue, and we're all here to get to 500 MHz. So I have a question for the Committee. Is there some percentage of the 500 should be dedicated to unlicensed devices or not? I mean, because we got to make that decision, I think. Because I think Karl said that the fundamental consumer of the 500 will be commercial carriers. You sort of said that.

MR. NEBBIA: On the one hand --

MEMBER CROSBY: You sort of said that.

MR. NEBBIA: This is Karl.

Certainly --

MEMBER CROSBY: I mean because we're not going to have microwave ovens in Federal Government bands and internationally,

although how do you argue with Dr. Furchtgott-Roth, but these are Federal Government bands, for Pete's sake and I mean one would think that we would be able to control devices: Where they're made, whose come in, what they are. I mean one would think that we could put our foot down in some of this stuff.

MR. NEBBIA: But do you want to, necessarily.

MEMBER CROSBY: Well, it's Federal Government bands. You absolutely should, at least in my humble opinion.

CHAIR FONTES: Karl?

MR. NEBBIA: Well, first of all, I think we have to remember the U.S. construct for unlicensed use. Unlicensed use can be in almost every frequency band in the spectrum. The problems we've had with garage door openers weren't because they were going wrong in an unlicensed band, whatever that is. They ere in a government band. There's not that many pure government bands. There are some of

them, 225 to 400 happens to be one of them where you don't have nonfederal use in there. But I think that if we look at this at a whole, we have to recognize that, yes, there is some federal spectrum, there's lots of shared spectrum where government services or other commercial services could certainly get impacted.

In looking at the questions -- but I agree with you, we do have to look ahead. And one of the further questions here is: Should we in fact set aside spectrum for unlicensed? That's one of the further questions.

And as we go through the 500 MHz if there's other bands that people feel like we should allow increased use by unlicensed, what I say by that is higher powered levels or increased duty cycles, or whatever? Because 900 and 2.4 started out as they were ISM bands and they were also radar bands at the same time, and those things work pretty well

together. But, we allowed unlicensed an increased or different operating parameters than the normal across the spectrum types of things.

We still do need feedback. I realize the emphasis of the recommendations here are on how do we prevent this in the future, but there are a lot of dumb devices out there. A lot of devices, for instance if I want to make a car key fob that's going to open my car, you're really going to have to argue with me as to why that key fob should have to have a service contract with a service provider to contact and find out whether I got to change my key fob every once in a while. I mean, there's lots of that stuff out there, garage doors are probably a great example of that.

So the emphasis of our question was when the government faces these issues, what should their response be to it? And it was interesting that one of the

recommendations in here was NTIA and the FCC should try to educate the folks up on the Hill more. And in the garage door case part of the problem was the users were going to their congressmen and saying -- but I'll tell you, it would be much more effective if the industry representatives of the garage door folks went to Congress and said "No, Mr. Congressman, you're wrong here. This is our industry. The government is right." Okay?

I think part of the education responsibility here lies on the people who are advocating for these devices, whether that is New America Foundation as a group that has that as their key function, or it's the service industries themselves that are supplying these devices have got to step up with DoD and whoever and say "This is the legal arrangement here. We will fix our devices." And in that particular case they've come up with some steps that they could take. I'm not sure they were optimum steps; they

just pick another government channel and wait until that shoe drops, but that's essentially what they've decided to do.

So, I think we need to look at that if we're going to look at some of the regulatory improvements to avoid the post hoc. I think we have to ask ourselves would we, in fact, recommend multiple channels devices? That was our problem on the garage doors. They had one frequency, got hit by DoD, they were out. Whereas, we have cordless phones that have ten channels on them and how much they cost? You know, you can buy a cordless phone system for ten bucks for a couple of phones.

So are we going to implement that? Are we going to talk more about improving the unwanted emission spectrum for unlicensed or is the emphasis just on making them cheaply?

But we do I think need to deal with these questions about it's not just a matter of fixing the future, which is the connected environment, how much that's going

to cost I don't know. But we are going to have to have responses for what do we do as people are out there taking their current wi-fi devices and they're playing with the software in them and coming up with different characteristics. We got to come up with answers for that. Or, if there's ten million of them out there, does DoD say "Okay, well we'll eat the change in favor of the ten million." That's certainly unfortunate under the rules.

But certainly I think we would like to see the responsibilities I think for the education to be borne in part by the industry that's promoting things here.

But also, I thought it interesting to focus on the dumb and cheap devices going to 900 and 2.4. Almost all the unlicensed devices in those bands right now I think are wi-fi is connected. The 900 we have a lot of spread spectrum internet service providers and so on. They are connected. So to me, it's a

pretty big question.

Are we're really talking about moving all the dumb devices that are now happily dumb in all the other bands they're in into one of these bands? I'm not sure, but I think we have to deal with those dumb devices that are out there. And as Pepper said, you know the cost factor of taking those dumb things and trying to make them smart devices, you know is, I think, a challenge.

And I also have the last question, this is I guess a legal thing as you are enforcing the smart capabilities. Somebody buys a piece of equipment with known characteristics to it. What is the legal construct that's required for the FCC to enforce the manufacturers then going into your device at home and changing what you bought? That I think is a significant issue.

CHAIR FONTES: Okay. So I'm going to turn it back over to Greg so we can move on in the agenda.

CHAIR ROSSTON: So I think, Michael, you and your Committee have a lot of issues that have been brought up and things to think about. So I think we're going to take a five minute break and then start again and get back on schedule.

I do think that the New American Foundation should refer to these are differentially, intellectually-abled devices for the 99 percent. I went to Berkeley as an undergrad, you know.

So, back in five minutes.

(Whereupon, at 11:05 a.m. the above-entitled matter went off the record and resumed at 11:13 a.m.)

CHAIR ROSSTON: Okay. We are ready to move to the Spectrum Management Improvement Subcommittee, and Mark and Bryan.

MEMBER GIBSON: Bryan disappeared. Actually, Bryan was going to make some introductory comments. So if he can make introductory comments when he gets back. I

don't know what that's called, maybe post-ductory. Let's hope not.

So our group was the Spectrum Management Working Group and our responsibility was looking at how to improve data and how to clean data up and the best practices for doing that. So we presented our work in Boulder. It was 90 percent done, and in the ensuing time since Boulder we finished the ten percent and cleaned it up and had a series of recommendations.

I'd like to first take a minute and thank the subcommittee because I think we drove pretty hard on it. But also the NTIA for their cooperation. You know, they were very helpful in helping us better understand some of what's going on.

So, do you want to make your introductory comments now?

MEMBER TRAMONT: Yes. My problem is I didn't respect the five minute rule. All right.

So, there are two contributions from our Committee today. One is consistent with our presentation in Boulder. We have transformed our PowerPoint presentation into what is aspired to be a five page report consistent with our co-chairs' directive, however this time it turned out to be seven, but hopefully the chairs will give us discretion to proceed in a longer format.

All right.

And then in addition, we had previewed our second question in Boulder and we have expanded on that, the question we're going to discuss next and turned that into our preliminary PowerPoint.

The report itself is focused on the techniques that can be used to validate new data. This is all growing out of the GAO report. Identifying incorrect erroneous data, maintain accuracy over time and then ensure compliance. And then the second really is focusing on the data set that is necessary for

future effective Federal Government spectrum maintenance and planning activities.

And so with that, Mark is going to present the final report on the first question and the preliminary report on the second.

MEMBER GIBSON: All right. Thanks, Bryan.

So with that as a backdrop, I'll go ahead.

If you'll recall, the work was to -- well, we defined our task as looking at best practices that are undergone in a couple of areas.

One was we wanted a regulatory best practices, and so we took a look at the Commission and they do indeed have best practices, as well as industry including frequency coordinators, database administrators and the like and, you know got a good sense. And then we looked at some other areas where data is exchanged that's not telecom data and we pulled some information

in. There was some intelligence from, for example, the Whois database and how that works.

And then we also looked at guidance that came out of the OSTP on best practices for just data in general.

And those were our data for data, if you will, but those were our intelligence or information. And so based on that we came up with, I think, six or seven recommendations. And so I'll walk through them and then we can discuss if we need to, and then vote at the end.

As we said in Boulder, our first recommendation was to perform a one time system wide data accuracy and clean up effort. And I'll read that: "As soon as practicable, NTIA should perform a one time system wide data accuracy and clean up effort. The effort is needed to establish a baseline and address existing errors."

If you recall, the backdrop on

this was something that GAO said were some glaring errors in GMF.

All Federal Government spectrum assignments should be reviewed. NTIA should lead this effort with an mandate for the federal agencies to cooperate. The goal should be to assure that assignments in the GMF accurately reflect the systems deployed and in operation and capture any missing assignments.

Karl had asked, and this is in the last recommendation, that we put a cost to that. And we took a swag at that -- maybe a wag, but we did try to put a cost to that. So that's the first recommendation is essentially clean up the data that's there. You can't instill best practice if you're basing it on bad data.

And the second recommendation it could be a subset, if you will, of the first but we wanted to break these out. The second recommendation is: To establish goals and metrics for data accuracy and milestones for

achieving those. So we say recognizing the implementation of the first recommendation may take time. NTIA should consider a phased approach with established interim phased milestones. NTIA could apportion this effort by band, agency, station class, et cetera.

In addition, the effort could be separated into a system wide review of all data records to determine whether errors may be concentrated in a particular band, agency, class, so on and so forth.

The clean up effort could focus on the areas with the highest concentration of errors or in errors that have the greatest impact on accurate spectrum assignments. The idea behind this is break it in pieces. How do you eat an elephant? One bite at a time. Well how do you clean database? One bite at a time. And that's what this focuses on.

The third recommendation is to increase the agency accountability for data accuracy by strengthening enforcement. We

learned in their discussions, and we knew this, that the GMF reflects the ownership of the agencies for that data. NTIA is really the database administrator, they don't own that data. It's owned by the agencies, and I know we all know that. So in the end in the agencies really have to be the ones responsible for at least initiating the effort.

And so one of the best practices we tried to overlay on this is how industry deals with data clean up and whatnot. And there are penalties for not doing a good job and rewards for doing a good job, and that's what this next bullet addresses. Increase agency accountability for data errors by strengthening enforcement. NTIA should increase federal agency accountability for data accuracy by strengthening enforcement in three ways:

First, NTIA should adopt more rapid and clear escalation procedures,

specifically high ranking government officials should be responsible and accountable for ensuring prompt review of data and ongoing data accuracy.

Second, NTIA should strengthen the process of requiring responsible individuals to certify that accuracy of spectrum data.

And third, NTIA should shorten the five-year review cycle. A two or three-year cycle is more appropriate to identify and correct errors in a sufficient time frame. So that's the fifth recommendation.

The fourth recommendation is to investigate use of distributed databases. The idea behind this is that, and we've learned this by looking at GMF and other federal databases, is that a lot of the data is jammed in one data table, if you will. So, there's no facility to do what you say in the data world normalized. So you're compartmentalizing data elements that are unique so that you don't have to enter it each time. So the idea behind

this is you use distributed databases to improve accuracy so that you only update one database at one.

So the NTIA should investigate the use of distributed databases to improve accuracy. Distributed databases link together multiple sources of unique data with flow through which includes data access and transparency while minimizing data errors.

I'd also call normalization the process organizes the data to minimize redundancy. These databases also localize responsibility for data collection and maintenance which limits control.

The idea, for example, if you have a data record that has an antenna, you don't want to put the antenna pattern in that record if the antenna pattern is going to be used by multiple databases. That's an example.

The fifth recommendation is to consider requirements to support data accuracy as FSMS is developed. And actually, the FSMS

under work you'll see that represented in ongoing work. For us, the FSMS while known as a program is a little murky because we don't understand a lot about what are the requirements of FSMS as it relates to data accuracy. So, you know to the extent that we're suggesting things that are already being considered in the program plan, you know we need to understand that a little better.

Nonetheless, the recommendation is as the FSMS is developed, NTIA should consider implementing methodologies described in the sections above to support data accuracy. Those are things like distribute databases and whatnot.

The full range of such methodologies should be examined and considered for implementation.

Finally, we put some cost to it. We did try to put money where our mouth is, and that was based on Karl's request, from Boulder. And so the recommendation is that

Congress allocate funding to support these initiatives.

And so we came up with a ballpark number that we can certainly talk about, but we said NTIA should request that Congress fund these initiatives. Indeed, they won't happen if they're not funded. Across all federal agencies not just NTIA.

We estimate the appropriate funding level to fully perform the accuracy effort is about $2 to 4 million, depending upon how the scope is defined when the project starts, period of performance and whatnot.

Now we based this estimate on assuming a percentage of data errors across all federal assignments. We assumed there are about 244,000 assignments, that's based on some comments on the record, maybe more, maybe less but that's our starting point. And we assumed a certain amount of time to fix a certain amount of data errors and a certain amount of time to fix them and apportioned the

cost to that. And so that's how we came up with that number.

And then the funding should come from several sources including possibly spectrum auction proceeds. And that precedent has been established.

And I believe that is the end of the recommendations. So we can have discussion and vote, and then we'll talk about our next work.

CHAIR FONTES: Is there a motion to accept -- do we have a second?

MEMBER EPSTEIN: Second.

CHAIR FONTES: Okay. Discussion? Karl?

MR. NEBBIA: Once again, thank you for your work on this. I know this group is driving pretty hard with regular meetings and so on.

And I do appreciate the recognition that making these happen does require either funding or shifts of resources

to apply to it. Because to go out to an existing database that's been built over quite a number of years is going to take some specific effort.

We already have begun discussing with the IRAT the aspect of getting confirmation or affirmation of the characteristics linked to somebody's specific name, which I think is always helpful. There's always a little bit of a pride of ownership there. And it's just finding the people who are willing to sign in the right place that is an issue.

I think on the question of metrics, we have I think at least by our experience identified that the places where we've had the most errors in terms of equipment that may have existed at one time and no longer exists, that type of thing, generally has to do with our fixed microwave lengths that have been put up at various times and then taken down or with the placement of

specific sites as part of a mobile radio system on the ground. The challenge we have there is that if we try to measure the impact of those errors, it appears in terms of making spectrum available more broadly and so on to be fairly small in terms of their impact.

So, for instance, when we were relocating out of 1710 to 1755 and certain agencies have said here's our estimate of cost, then when it came time to actually move and they went out to the site where they thought they had a system and then found out, yes, that system got pulled down a number of years ago and they had to give back that money, it did show that for those fixed microwave systems that we had some percentage of them that we found were no longer in existence.

Did that change ultimately our ability to relocate the spectrum or in reality speed the process of the wireless industry moving into the band? I'm not sure that it

did.

On the mobile side if we find some of the specific sites as part of a mobile system are not being used, does that significantly alter the process when in fact the Federal Government has two small bands essentially that we use for LAN mobile systems. So it's not like that opens up a great deal.

Still I think it's important as we go forward in any of our analysis and so we've got to have accurate data, and we certainly accept and appreciate the recommendation about trying to do certainly a one time sweep to bring it up to date.

We have discussed with the agencies the possibility of increasing the frequency of their updates, their five-year moving to two or three-year. Obviously, that requires them to apply resources to it. Because the thing we don't want is twice as many reports that don't mean anything if

they're not actually going through the checking process. So, I think having them more often I think does make it more likely that somebody will remember that, yes, we're going to turn this system off. But we don't want to just create more paperwork in the process.

MEMBER GIBSON: All right. Thanks, Karl.

This is Mark again.

One comment I'd like to make on the validity of cleaning up certain records as it relates to making spectrum available. And I know some of the carriers in the room would resonate with this.

That it might not make more spectrum available on a macro basis, but when you are trying to design a system in an area, and you're looking at launching and up against a launch deadline, the value of accurate data is invaluable, if that make some sense. But it is invaluable to have accurate data.

It's late in the day.

As you know, you all made that data available before any relocations occurred because it was also helpful to inform auction analysis, pre-auction analysis to determine bidding strategy. And we went through that data and found lots of errors in it that were large errors. You know, certain links were going across the country, and that sort of thing.

So, I think once that data were cleaned up and then made available for engineering work, as we went down to agencies to get more information we still were ongoing clean up efforts. And we know several carriers that were facing problems with getting to launch. I know once case specific where there was a clear data error. It was a piece of classified information, we understood. A clear data error that once the data was cleaned up that launch could move forward.

So, it might not make a difference for a broad allocation, but it really is

important in certain micro development important areas.

CHAIR ROSSTON: Tom?

MEMBER SUGRUE: Tom Sugrue.

On the funding question did you look at whether these activities could be supported out of auction proceeds under current law?

MEMBER GIBSON: Well, the current law, CSEA accommodates that now. I'm not sure. I'll leave it to the lawyers in the room to pontificate on that. But at least in our estimation the law for the relocation should have accommodated that.

Indeed, the law if you recall, accommodated certain monies for agencies to do pre-engineering. There was probably a misinterpretation among agencies as to how they would apportion that funds, but certain agencies did do it and others didn't. So our belief at least, and I'll let Bryan the attorney comment on it in greater detail, that

it can.

MEMBER TRAMONT: I think it can for bands to be reallocated, right, but you probably need to pass CSEA for longer term planning to make it happen.

We did not specifically look at it, but I would suspect that it would only be applied to existing bands that have been identified under existing laws. So you would need to have the enhanced CSEA language in order to do the system broad sweep.

Is that consistent, Karl, with your understanding?

MR. NEBBIA: Yes. I mean, certainly at this point the CSEA is tied to a specific relocation. As we move forward, that may be broadened. And I think still if you can tie the clean up of the data to a relocation analysis and study, that will probably be possible under the new arrangement.

If you're just talking about funding broadly a clean up of the database,

completely aside from that process, I'm not sure that there's any connection to that right now. But I mean one of the possibilities here because there's going to be questions about the cost. You've done your analysis, it was a certain number. Certainly we would hope that that specific number, you know somebody doesn't draw a conclusion here it's the locked in number, but it does give a sense that it's going to be several millions of dollars to go across and clean up the whole database, which is not too far afield from some of the things that we've looked at before.

But, for instance, if we want to do a specific analysis on a band to see if this can be shared or reallocated, to say that well maybe there should be some fundings to be provided specifically to do a clean up of that band, that may be some way of lessening the whole cost and getting specific to the bands that are of greater of interest to folks.

So, I mean that would be a

variation.

MEMBER SUGRUE: I mean, there is $5 billion from the last auction sitting in a trust fund that is designated for relocation.

And you're right, the present law is tied to a relocation decision. It's our view based by legal opinion, that once your relocation decision is made, you could actually tap into that. And you didn't have to wait for the next auction?

MEMBER GIBSON: Right.

MEMBER SUGRUE: And we share those views with OMB, who sort of grumped about them but we didn't get a clear view, other than at the time they were just holding on, you know "this is my money" type of thing, you know.

I mean, compared to $5 billion, this is a small amount and they seem to be interested sometimes when you can make a credible case that it will lead to greater funding down the road.

MEMBER GIBSON: And I just want to

put some clarity on the funding thing. You know, one's always hesitant to put a number, especially when it's got a million after it, although in the billion dollar budget I guess it doesn't matter. But that assumed a streamlined effort that was done all at once without really any of the issues associated with agencies having to overlay their procedures on it. So, if you were going to do it once, it was going to be a program, if you will, that's what it would take. You know, I think in practice it probably will be not that that, but we didn't want to go there and try to assume efficiencies or inefficiencies. We felt that that was an appropriate number based on the level of effort.

CHAIR ROSSTON: Okay. So we have a pending motion and second. And anymore discussion or can we go to a vote for our second report to Larry?

All those in favor?

ALL: Aye.

CHAIR ROSSTON: All opposed? Any abstentions? Okay. Great. That passes.

So now I'm going to pass it back to Mark to talk about the next steps for this group.

MEMBER GIBSON: Okay. Well, you know as Karl said, we drove it pretty hard. So I think we're going to take our foot off the gas here. You know, we have a job, we got to do.

So, what I wanted to do here is present the ongoing work, that we teed this up in Boulder and so we have had a little bit of effort.

The next plan was to look at the data you need to do spectrum analyses and how do you transition to a more data set. It is important. The answer is it important, is yes, so we got that off the table.

We reframed the question basically in this way, but here's what we're looking at, the question really is: What data is needed to

perform a complete set sufficient for spectrum planning? And this is for spectrum planning given any class of devise or service. You know, our background is microwave and mobile but if you're doing planning for LAN mobile type systems, it's going to be different. So we kind of tried to throw against the refrigerator, if you will, these data elements to see what stuck, and this is what sticks.

We want to tease these out a little more before we provide it as a recommendation, but these data elements that you see before you on this page and on this page are generally the data you need to do spectrum engineering and spectrum planning. And obviously these data are not generally maintained in licensing databases.

And I'll note that we're talking about maintaining data on received systems. You know, we can address that as the group continues to do work. But these are the data elements at least that the group thinks now

are required for a sufficient spectrum planning effort.

Still under consideration are how you handle receive-only devices. These might be like receive-only earth stations and things like that, or you know receive-only mobile devices.

Unlicensed spectrum/devices, how do you deal with that?

Waveform data to accommodate the cognitive radio and some of the policy-based work as well as other data to support dynamic spectrum access and whatnot.

Auto-frequency selection methodologies. Now we're sort of stepping off into the new world where you actually are putting more data to do auto-frequency selection, which makes it easier to do spectrum planning.

And then how do we get to these data sets? Obviously that's not going to pop up one day and it's already there.

The other follow up work we need to continue to do is on the FSM development to understand better what the FSMS is doing to accommodate this to address these data elements and how will it perform auto-frequency selection. So, you know we anticipate some additional discussion on that.

So that's the follow up work we're doing. Stay tuned.

CHAIR ROSSTON: Are there any discussion or questions for Mark or Bryan on the next steps for that Committee? I think they have set forth an ambitious agenda, and I hope you keep your foot on the gas.

On the agenda the next thing is next steps -- I'm sorry. Karl?

MR. NEBBIA: Just with respect to the ambitious agenda. Once again, I think in all of those questions that you laid out if you could try to take them on kind of one at a time. Because not only do we not want to burn all of you out, we can't necessarily

respond to a 100 new recommendations tomorrow.

So, we'll bring these in as we're looking for 500 MHz, as we're preparing a spectrum inventory, as we're talking about other controversial interference possibilities going on, which will still go unnamed. You know, we do these things day in and day out.

So we encourage you to focus on one, provide us the feedback. And it's both for all of your sake and for our sakes.

CHAIR ROSSTON: Thank you. Happy to hear that.

So I'm going to take a very, very, very narrow view of next steps and just say that after I finish talking, Brian will take on the opportunity for public comment. And then we're going to talk about our next meeting. And then we will adjourn officially and clear the room of non-members of the Committee, so that we have our ethics training.

I apologize. I don't know how we

can clear the phone line.

Okay. So we will then have our ethics training and move on. We may, hopefully, be ahead of schedule on that. But let Brian take off if he has a bigger picture of next steps and then public comment.

CHAIR FONTES: Okay. First off, I just want to thank everybody for all the work they've done. And this is a different approach to CSMAC in terms of identifying questions, focusing on them, getting responses to those questions and submitting them. And I think it allows us to kind of focus our energy rather than to be so consumed with a 100 questions in a report, et cetera.

So, I hope that this is something that is beneficial to everybody who is working on this and it allows work to move forward in terms of recommendations to NTIA throughout the CSMAC process rather than just at the end.

So, you know I hope you do appreciate this different approach to doing

things.

The next steps include what we just discussed, the idea of identifying additional questions. We'll work with Karl and a couple of the subcommittees wanted some direction on additional questions. So, we'll go ahead and work on those in getting them set out.

Our next meeting is our face-to-face meeting, if you will. March 1 of 2012. Can you believe that?

CHAIR ROSSTON: Let me clarify one thing just on the agenda, the Gunn Building. Is that the Gunns have been extremely generous Stanford and in the last couple of years. They've given two buildings. So make sure you look for the SIEPR Gunn Building if you get lost when you get there.

CHAIR FONTES: Who knew? Who knew?

So, in any event, I don't have any additional comments with respect to the next steps other than focusing on the additional

questions that will be coming to the subcommittees for their work.

Oh, I'm sorry.

MEMBER REASER: I think that the new CSMAC process ought to be identified as a best practice for all the federal advisory committees, quite honestly. Because the rest of these other ones just wind all over. I've been the victim -- I mean, I've been the head of several people reporting to me. This is a much better to do business and I think it ought to be something that would be adopted by other federal advisory committees if somebody wants to talk to GSA or somebody about that. Because it's much more focused and basically it does exactly what I think needs to be done; and that's having an input from experts into public policy making rather than the view du jour of whatever goes on.

So I thought it was very, very good and I'm proud to be a part of it.

CHAIR FONTES: Thank you for the

positive feedback. And we've tried to do this in some of the other groups over CSRIC at the Commission and trying to focus on specific questions as well.

Gary?

MEMBER EPSTEIN: Yes, I agree with that. And in keeping with that I would ask you to get back to the Committees as soon as feasible with specific questions. Because we're waiting and we won't start working until we really hear something.

CHAIR FONTES: Yes. That will not be an issue. So, thank you.

Again, now it's time to open it up for public comment. And what we'd like to do, I don't know how many people are -- could we just get a show of hands how many people are likely to provide public comment? Okay. One?

What's the best way to do this so that we have a microphone? If you don't mind going to the chair by the mic where Jennifer is vacating.

You know, there'll be time limitations on this largely in part because of the additional agenda we have to go through.

State your name please.

MR. SNIDER: Jim Snider, SpectrumBS.info.

It has been over six months since I provided an update on the accessibility of CSMAC's proceedings to the public concerning CSMAC's meeting access via webcast.

CHAIR ROSSTON: Jim -- Jim?

MR. SNIDER: Yes.

CHAIR ROSSTON: We'd like to ask you to do it about the substance of this meeting. We've talked about procedures many times.

MR. SNIDER: This is on the accessibility that relates specifically to this meeting.

CHAIR ROSSTON: All the materials were available for this meeting on the web, as far as I could tell, with total access.

MR. SNIDER: Yes. This is on the accessibility of meeting information.

The May 25, 2011 CSMAC meeting was announced without prior notice that the meeting would not be webcast because webcasting was prohibitively costly, costing some $6,000 a year. I complained about that policy during public comments at the end of the meeting. And the next CSMAC meeting on July 27th was webcast.

Prior to the July meeting I twice asked NTIA's DFO in writing for the budget calculations in which the $6,000 a year was based. I also asked about future plans for webcasting CSMAC meetings. As of early October, I had received no response and so I asked a third time. I was told that only half of future CSMAC meetings would be webcast because of budgetary constraints and received no response again to my budget questions.

When I asked again for the budget calculations and what was the principle by

which a meeting would be selected for webcasting coverage, noting that I did not find out about the lack of webcasting coverage of the May meeting until I was already present at the meeting, I was told that to find an answer to these questions I would have to file a formal request under FOIA. Now this was an interesting response for several reasons.

First, my request to find out what was the method by which 50 percent of the meetings would be webcast would be unlikely to get a response because it is unlikely that it is a written policy. If it were a written policy, I imagine it would be posted on the web.

Second, I have made numerous FOIA request for NTIA over many years, and I can assure you that the process has been hell. The complete process usually takes more then half a year, even for perfectly routine legal requests. The charges from my standpoint are typically outrageous, and then I must get lots

of unrequested documents, but not those I did request.

Now, concerning CSMAC's meeting access via the phone. At the last CSMAC meeting on July 27th of 2011, Chairman Brian Fontes made the following statement when public comment was to be taken: "Okay. Great. We're through with the presentations. So what I'd like to do now is open it up for comments from the public, if you will. Those on the phone first. Now I'll be perfectly honest with you, the phone connection is abysmal. If I were responsible for it, I would apologize, but I'm still apologizing. Is that being polite? But is there anybody calling with a question? I will take that as a no. I apologize." To which I replied "Yes," I was on the phone and the connection was abysmal.

Now I would to respond to allegations made to me at the May 25th meeting, to which I was not given a chance to respond at that meeting. I will focus on just

two of the allegations reported in the trade press after that meeting without any opportunity for me to respond.

NTIA Administrator Larry Strickling said "I sat here for two years listening to you raise these totally spurious allegations about us, and they've gone without a response." To this I would briefly reply, members of CSMAC have made many responses to my comments over the last few years.

For example, one of the reasons CSMAC meetings now have readable transcripts is because there was general agreement that the transcripts were of such poor quality that they had been largely unusable.

As for my FOIA complaints and NTIA's responses, everyone here knows that I posted many of them and will post more when I have time on a public website. I believe that the record is clear. NTIA has violated both the spirit and the letter of the FOIA laws.

Second and lastly, Strickling

said: "Snider asked NTIA to expel a member of NTIA based on allegations that the unnamed individual plagiarized some of Snider's work," to which I replied "I made no such request. I defy you to find any such statement in the transcripts of the dozen or so CSMAC meetings where I've spoken before you. Nor have I made such a request elsewhere. What I have done is alert CSMAC to a CSMAC report who author used attribution inconsistent with academic norms of attribution. To the best of my knowledge, no change was made to that report."

I have also repeatedly alerted CSMAC to the fact that the credentials the same individual submitted to serve on this body were misleading, and even possibly in violation of the law. Neither Strickling or anyone else associated with CSMAC has requested additional information from me nor responded to the merits of the information I provided them.

As far as I'm concerned, the

NTIA's response to this matter couldn't be clearer. Although I've spent less than 30 seconds of CSMAC's meeting time during the last year raising this issue, since I don't want to take up people's time beating a dead horse, I don't intend to bring it up again.

In closing, I doubt NTIA's Administrator would have exploded with fury at me at the last meeting and made the accusations the way he did if he knew the meeting would be webcast and archived. That's one reason I and other open-government advocates think webcasting meetings is important. It reveals important information that cannot other be acquired.

Thank you for your time. And I believe these type of comment are quite in order for a CSMAC meeting.

Thank you.

CHAIR FONTES: Thank you very much, Jim, for your comments.

Are there any other public

comments? Thank you.

Next, we're over. This is it.

So I want to thank everybody for being here today. For those on the call, appreciate your sitting on the other end of the phone during the duration of this almost three hour meeting. And those who are CSMAC members on the phone, should stay on the phone for the ethics briefing, which will now take place.

I wish everybody the best of the holiday season. Travel safely, enjoy time with family and friends. And I'll see you as a group in the new year.

Thank you.

(Whereupon, at 11:48 the above-entitled matter was adjourned.)

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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: 11-10-11

Place: Washington, DC

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