

UNITED STATES DEPARTMENT OF COMMERCE  
NATIONAL TELECOMMUNICATIONS AND INFORMATION  
ADMINISTRATION

COMMERCE SPECTRUM MANAGEMENT ADVISORY COMMITTEE  
(CSMAC) MEETING

Via Teleconference  
Tuesday, December 19, 2023

## 1 PARTICIPANTS :

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3 REZA AREFI

4 DONNA BETHEA-MURPHY

5 HILARY CAIN

6 MICHAEL CALABRESE

7 ALAN DAVIDSON

8 THOMAS DOMBROWSKY, JR.

9 MARK GIBSON

10 SCOTT BLAKE HARRIS

11 DALE HATFIELD

12 CAROLYN KAHN

13 JENNIFER MANNER

14 PAUL MARGIE

15 JENNIFER MCCARTHY

16 KARL NEBBIA

17 LOUIS PERAERTZ

18 DANIELLE PIÑERES

19 CHARLA RATH

20 GLENN REYNOLDS

21 ANTONIO RICHARDSON

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

2 (2:00 p.m.)

3 MR. RICHARDSON: All right, for those of  
4 you on the phone, please make sure you mute your  
5 phones and everything. But real quick, let me  
6 just have the staff here do a quick briefing,  
7 please.

8 MS. MANNER: All right. Welcome to  
9 NCTA. We're happy to host you. I just wanted to  
10 go over a couple of housekeeping items. There are  
11 push-to-talk mics on the tables, so whenever you  
12 are speaking, just make sure it's on so the folks  
13 on the phone can hear you and also amplify your  
14 speaking voice in the room. There are outlets for  
15 your laptop if you need to plug them in right near  
16 where the mics are.

17 Let's see -- oh, and everyone should  
18 have a one-time Wi-Fi code. It's an individual,  
19 so you can use that to log into the Wi-Fi. And I  
20 think that covers it -- oh, bathrooms are outside  
21 this door back where you all came in in the  
22 entrance near the reception. So yeah, that's all.

1                   MR. RICHARDSON: And you're not allowed  
2                   to go to the bathroom. I just thought I'd mention  
3                   that part.

4                   All right. Okay, so first off, thank  
5                   you NCTA for hosting us here. Of course, I'm  
6                   Antonio Richardson. Good afternoon, everyone, and  
7                   welcome to the Commerce Spectrum Management  
8                   Advisory Committee Meeting. I'm the designated  
9                   federal officer for this committee and I'm also  
10                  going to put out a couple housekeeping notes,  
11                  which is one, basically, Emily's already spoken  
12                  about it. Here in the room, please hit the green  
13                  push button to speak. And also, Charla -- and  
14                  Jennifer may mention this as well -- please make  
15                  sure you mention your name so the transcriber can  
16                  ensure they have the right person speaking at the  
17                  time.

18                  The other part of this is this will be  
19                  recorded, of course, in helping to draft the  
20                  summary minutes, and your voluntary participation  
21                  demonstrates consent to today's recording. I will  
22                  now turn this over to Charles Cooper and the

1 Associate Administrator of the Spectrum  
2 management. Mr. Cooper, please, sir.

3 MR. COOPER: (inaudible)

4 MR. DAVIDSON: Thank you, Coop. And it  
5 is really nice to be here. Welcome, everyone, to  
6 this meeting of the Commerce Spectrum Management  
7 Advisory Committee and our final meeting of this  
8 term. There's a lot to say, but I want to start  
9 by saying, thank you to our co-chair, to Charla  
10 Rath, and to Jennifer Manner. Congratulations to  
11 both of you for shepherding this group this  
12 current CSMAC term to its very successful  
13 conclusion, as we are going to discuss today.

14 I will say I have a real special thank  
15 you to all of you for all your hard work on the  
16 committee, and particularly, on the subcommittees  
17 and the presentations. I'm really looking forward  
18 to the presentations we're going to be hearing  
19 this afternoon. I know the questions that we teed  
20 up for research were very important to NTIA, very  
21 important to the country. And your management --  
22 and your work in addressing it, rather, is vital

1 to how we approach spectrum policy and management.

2 I will say I have a real special  
3 affection maybe for this CSMAC class. You started  
4 the same week, basically, or were appointed the  
5 same week that I was confirmed by the U.S. Senate  
6 and started in my role. So, I always felt like we  
7 were in sync here. And I don't know how you feel,  
8 but it's been a pretty busy two years. So, I can't  
9 quite believe that the two years have gone by, but  
10 I'm really proud. I'm proud of the work that  
11 NTIA's been doing. I'm proud of the work we've  
12 been able to do together. And I'm extremely  
13 impressed by the quality of the reports that we're  
14 going to be discussing today. So, thank you for  
15 this work.

16 Before we also dig in, I also just want  
17 to thank our hosts at NCTA for opening their  
18 lovely facilities up and for hosting this meeting.  
19 So a few other words to start. We normally start  
20 these meetings with a quick update from NTIA on  
21 what we've been up to lately. I do hope that --  
22 and pretty much think that -- you've hopefully

1     been following along, because there has been a lot  
2     going on in recent weeks and months.

3             And of course, you already know the  
4     marquee event last month. The White House  
5     released our national spectrum strategy along with  
6     a comprehensive presidential memorandum on  
7     spectrum policy. This is work that was a long  
8     time coming. I can't help but do a quick  
9     shout-out to Scott Harris, who was really the  
10    force behind so much of this, and particularly,  
11    shepherding that national spectrum strategy.

12            We were saying on the way over here,  
13    both of us have been a little bit skeptical about  
14    whether we can pull it off on the timing, and we  
15    were so pleased we were able to get it out before  
16    WRC. And it represents a huge amount of shuttle  
17    diplomacy, coordination, debate, and ultimately,  
18    consensus building within the federal government.  
19    And I'm so pleased for it because I think this is  
20    in fact a watershed moment for spectrum management  
21    in the United States. Not only will the strategy  
22    lead us to studying more than 2700 megahertz of

1 spectrum, nearly double our original target, study  
2 it for potential repurposing, it also charts a  
3 course for greater collaboration inside and  
4 outside of government. And it recognizes the need  
5 to harness innovation and technology for U.S.  
6 leadership in this space.

7           And people even in some ways really  
8 learned the lesson of CSMAC. You know, I think  
9 the need for private sector collaboration, the  
10 importance of the kind of conversation we have  
11 here, you see it. It is embedded -- it's a pillar  
12 of this strategy, and so we hope to take the kind  
13 of collaboration that we've built here at CSMAC  
14 over time and use that in the strategy going  
15 forward.

16           So our work does not end here. Scott,  
17 who has been direct reference, he will give you --  
18 provide more detail shortly on the implementation  
19 plan and particularly how non- federal  
20 stakeholders can engage in it. For now, I just  
21 want to thank so many of you who are here for your  
22 participation and your feedback as we develop the

1 strategy. We always intended it to be an open  
2 process. We got probably more process in some  
3 ways than Scott, maybe, and team were hoping for.  
4 So many comments. So much input. So many good  
5 ideas. And I think that was incredibly valuable  
6 in being able to reach the conclusions that we  
7 did. And so, we hope we'll be able to continue to  
8 draw on your expertise and your wisdom in the  
9 future.

10           You know, the spectrum strategy may have  
11 been the main event for us last month, but it  
12 doesn't overshadow the work that you all have been  
13 doing here in this cycle and reviewing the  
14 implementation of CBRS, as in broadband radio  
15 service, exploring use cases for 6G, identifying  
16 potential improvements in electromagnetic  
17 compatibility, those things are going to be  
18 foundational for the future of spectrum  
19 management.

20           And I have to say -- I'm looking at the  
21 report -- I was pretty blown away. We were  
22 talking about how exceptional this cycle felt.

1     Extremely substantive. Really impressive pieces  
2     of work. I had to be reminded that you're all  
3     doing this on a volunteer basis, so thank you for  
4     your service.

5             You know, when I look through -- you  
6     know, on CBRS, we asked you to take stock of the  
7     service after several years of deployment. You  
8     responded by asking pretty comprehensive questions  
9     to a broad base of stakeholders. And the result  
10    is a valuable insight, I think, into an ecosystem  
11    that's successful and viable but can also evolve  
12    and scale further. I think that comes through in  
13    the report. This is good news for a regulatory  
14    and engineering approach towards dynamic spectrum  
15    access, and you can see in the spectrum strategy  
16    how important we think that will be going forward.

17            On 6G, even though we know 6G wireless  
18    technology is still some ways off, it is  
19    definitely not too early, not too early at all, to  
20    prepare for it so that the United States can lead  
21    the world in its development and implementation.  
22    And we asked you for your help in evaluating



1 potential use cases, including in technologies  
2 related to science, public safety, space, sensors,  
3 and others. And we sought guidance on how 6G use  
4 cases can be utilized for federal operations as  
5 well.

6           The resulting recommendations are  
7 extremely helpful. They're going to help NTIA and  
8 our federal partners prepare for the opportunities  
9 that 6G may bring. As we know, the federal  
10 government's early adoption of new technologies  
11 can often bring -- it often is instrumental, I  
12 would say, in creating new ecosystems and markets  
13 for broader nonfederal use. And I think one of  
14 the biggest questions I always hear about 6G can  
15 give us some examples on what it's going to look  
16 like, and I think you have helped us with that.  
17 And we hope that it's going to be very useful.

18           The third report we're going to hear  
19 about today will be from the subcommittee that  
20 looked at electromagnetic compatibility  
21 improvement. And we wanted to know from you how  
22 radars and other types of systems can better exist

1       -- co-exist -- in co-channel and adjacent channel  
2       situations. And then narrowed the focus, I know,  
3       on how best to analyze the compatibility of  
4       commercial wireless systems and federal  
5       aeronautical radar systems operating in the 5 to  
6       16 gigahertz range. Of course, this is at the  
7       heart of some of the most important midband  
8       spectrums needed for both federal and nonfederal  
9       usage. And we're looking forward to your  
10      recommendation in areas of propagation modeling,  
11      interference mitigation, and other potential  
12      improvements. So, thank you for that work too.

13               So I'll just say in conclusion, we've  
14      had a very busy autumn, and the new year looks, if  
15      anything, even busier as we ramp up this sort of  
16      implementation plan of national spectrum strategy.  
17      I like to say that the reward for good work is  
18      more work. So, the team here is ready for that.

19               And with that in mind, I again want to  
20      say thank you for your time this afternoon and for  
21      all your dedication to the work you've done in  
22      CSMAC. After today, I should note that there will

1     be a process for rechartering and reconstituting  
2     this advisory committee. For those of you who  
3     might not be rejoining us for the next cycle,  
4     please be sure, know that your hard work has been  
5     incredibly impactful and we really appreciate your  
6     service. And for those who are inclined to  
7     continue with us, I just want to say, I can tell  
8     you there will be no lack of important and  
9     exciting work ahead, given what's facing us in  
10    this phase. And I think we'll have more to say  
11    about the process and how it's going to open up in  
12    the coming weeks.

13                 So with that, again, a big thank you.  
14    It's great to see all of you. It's good to be  
15    able to join you again for another round, the last  
16    round of this term. But thank you and onward.  
17    I'm going to turn it back over to our co-chairs.

18                 MS. RATH: Thank you. Thank you very  
19    much, Assistant Secretary Davidson, and  
20    congratulations right back to you for everything  
21    that you've accomplished in this last year,  
22    particularly for meeting the deadline that, you

1 know, you all -- I think, Scott, how many times  
2 were you here saying that it would be done before  
3 the WRC? So, if you couldn't hear me --

4 MR. DAVIDSON: It would be done before  
5 year-end.

6 MS. RATH: Yes, you did say before  
7 year-end, but I think at one point I heard  
8 (inaudible)

9 MR. DAVIDSON: I said it was a stretch  
10 goal. Got very good about meeting his stretch  
11 goals, it turns out, yeah, setting expectations  
12 and overperforming.

13 MS. RATH: And thank you very much for  
14 the kind introduction. Good afternoon to  
15 everybody. And I also wanted to say something.  
16 This is not a hard group to shepherd. And I think  
17 Jennifer would agree with me on that. This is a  
18 very hardworking group of people, all of the  
19 subcommittees. And as you said, you know,  
20 production of pretty fabulous work. I don't need  
21 to go into more detail.

22 This has been a very busy quarter for a

1 lot of different reasons, but also, just  
2 particularly, the three subcommittees that are  
3 reporting out today had an incredibly busy quarter  
4 dealing with sort of getting to the final report  
5 as well as in the case of CBRS, obviously,  
6 continuing to do a number of interviews. So, we  
7 really appreciate everything that you've done.  
8 And I always feel like I have to mention the  
9 fourth subcommittee, since, you know, this is our  
10 last session in the term and you all did it a long  
11 time ago. But we still very much appreciate the  
12 work that you did and produced for us earlier this  
13 year, so thank you.

14 So, today, without spending a lot of time  
15 on this -- we want to move right to the  
16 subcommittee reports, but first for Jennifer to do  
17 her remarks and roll call, but I did want to  
18 mention just to repeat what Antonio said earlier.  
19 Please try and remember to say your name first  
20 before speaking. And, you know, we've been back  
21 in person for a while, so we should all remember  
22 to raise our temp cards when we want to speak.

1                   For those of you who are on the phone,  
2           we'll get a sense of how many of you are on the  
3           phone when Jennifer does roll call, but what we'll  
4           probably have to do is wait until people here in  
5           the room have spoken and then ask for your  
6           participation, unless there's something that is  
7           really -- you're dying to say, and then, I  
8           suppose, you can kind of shout it out. But  
9           anyway, over to you, Jennifer.

10                   MS. MANNER: Okay. Well, thank you,  
11           Charla. And this is Jennifer Manner for the  
12           minutes. But I'll start off on a good note and  
13           thank you, Assistant Secretary. You know, we  
14           certainly have been honored -- I think I speak for  
15           both Charla and I -- to work with this entire  
16           group, especially the co-chairs, but all the  
17           members on, what we think, production of extremely  
18           valuable and good reports.

19                   And I do want to just say -- and we'll  
20           mention this at the end -- how important the NTIA  
21           staff and the FCC staff has been. You know,  
22           Antonio we'll praise 5,000 times during this

1 meeting. He'll end up blushing. But both him and  
2 also our liaison have just been fantastic, as has  
3 the rest of the staff of NTIA. It's been willing  
4 to take our calls. And Charla and I are not the  
5 lowest maintenance co-chairs -- okay, Charla is  
6 low-maintenance. I am SOA maintenance. So, I just  
7 wanted to say thank you.

8               So I am excited to hear the output of  
9 the reports today. But before I do, I'm just  
10 going to take roll call. So, if you can just  
11 signify by saying aye, that would be helpful. And  
12 I have a couple of people I know who aren't here  
13 but I'll call just in case anyway.

14              Starting with Jennifer Alvarez.

15              MS. ALVAREZ: Aye, I'm here.

16              MS. MANNER: Thank you. Reza Afari --  
17 or Arefi, sorry.

18              MR. AREFI: Aye.

19              MS. MANNER: Donna Bethea-Murphy.

20              (No response)

21              MS. MANNER: Hilary Cain.

22              MS. CAIN: Yep, I'm here.

1 MS. MANNER: Michael Calabrese.

2 MR. CALABRESE: I'm here.

3 MS. MANNER: Tom Dombrowsky.

4 MR. DOMBROWSKY: Here.

5 MS. MANNER: Mark Gibson I don't think  
6 is here, but I just want to double check. Okay.  
7 Dale Hatfield. Dale, are you on the phone? Okay,  
8 we'll come back just in case. Carolyn Kahn.

9 MS. KAHN: Yes.

10 MS. MANNER: Me, I'm here. Paul Margie.

11 MR. MARGIE: Yes.

12 MS. MANNER: Jennifer McCarthy.

13 MS. MCCARTHY: Here.

14 MS. MANNER: I know where all the  
15 Jennifers are. Karl Nebbia.

16 MR. NEBBIA: Here.

17 MS. MANNER: Louis Peraertz I don't  
18 believe is joining us. Danielle --

19 MS. PIÑERES: Here.

20 MS. MANNER: Perfect, and you are here.  
21 I know Charla's here. Glenn Reynolds.

22 MR. REYNOLDS: Here.



1 MS. MANNER: I don't this Dennis  
2 Roberson is on the phone, but just wanted to  
3 check. Okay. Andrew Roy.

4 MR. ROY: Yes, good afternoon.

5 MS. MANNER: Thank you. Jesse Russell.  
6 Okay, we'll come back just in case. Steve  
7 Sharkey. Okay, we'll come back. Mariam Sorond I  
8 know I saw. Rikin Thakker, I know he's hosting  
9 us, so he gets -- and he got really good snacks,  
10 so thank you.

11 MR. THAKKER: You're welcome.

12 MS. MANNER: Bryan Tramont.

13 MR. TRAMONT: I'm here.

14 MS. MANNER: Jennifer Warren I know is  
15 here.

16 SPEAKER: You said you know where all  
17 the Jennifers are.

18 MS. MANNER: You've got to watch them.  
19 Robert Weller -- in a good way. In a good way.

20 MR. WELLER: Yes, hello, everyone.

21 MS. MANNER: He's not a Jennifer.

22 Patrick Welsh. Patrick? And David Wright. Okay,

1       so just going back on the people I didn't hear  
2       from. Dale Hatfield. Jesse Russell. Steve  
3       Sharkey. And David Wright. Okay, and with that,  
4       I'm going to thank everyone and turn the floor  
5       over to Scott for some remarks. Thank you.

6               MR. HARRIS: Thank you. So, look, I'm  
7       sure there's been a time when the spectrum world  
8       was busier and more high profile than it is today.  
9       I can't actually think of such a time, but you  
10      know, it's really quite extraordinary, right? And  
11      for the past month or so, the entire spectrum has  
12      been riveted, I would say, by the World Radio  
13      Conference in Dubai. And I want to thank those in  
14      this room and on the line who basically put their  
15      lives on hold for four or five weeks to engage in  
16      U.S. interests at the conference.

17             Speaking for those of us who remained in  
18      D.C., I could not believe how good I got at  
19      translating East Coast time into Dubai time in my  
20      head, nor could I get over how willing Coop was to  
21      schedule calls at 3 p.m. D.C. time -- midnight  
22      Dubai time, for those of you wondering -- and

1       sometime, maybe over a scotch or two, I'll tell  
2       you about the calls we got from Dubai in the  
3       middle of the FCBA dinner. That was a new one  
4       even for me.

5               Speaking of Coop, I thought he could,  
6       before we go any further, provide us some  
7       specifics on the outcome of what I thought was,  
8       from the U.S. perspective, an excellent  
9       conference. So, Coop, can I turn the floor over to  
10      you for a bit?

11             MR. COOPER: Sure, Scott. So, we  
12      completed the WRC thanks to the efforts of  
13      approximately 200 delegates from the U.S.  
14      government and the private sector and almost 4,000  
15      delegates worldwide, representing over 160  
16      countries and sector members. These are record  
17      participation not only in the U.S., but worldwide  
18      at the WRC, certainly illustrating the growing  
19      demand for spectrum access.

20             In this brief overview of the WRC  
21      accomplishments, I'll touch on two lines of  
22      efforts that occurred. One were the results of

1 the just-concluded WRC23 agenda as set by the  
2 previous WRC19 that was held in Sharm El-Sheikh,  
3 Egypt, if you remember that, in 2019. And of  
4 course, the second line of effort is developing  
5 the agenda for the next WRC, which will be held in  
6 2027 at a location still to be determined.

7           So on the current of the WR23 agenda  
8 items, the accomplishments include that we  
9 harmonized spectrum available, so 5G, across the  
10 Americas by securing approval for what we call  
11 IMT, international telecommunication, or what we  
12 refer to commonly in this country as 5- or 6G, and  
13 the 3.3, 3.4 gigahertz, and the 3.6, 3.8 gigahertz  
14 bands in the Americas region too, while ensuring  
15 protection for important incumbent radio location  
16 radar systems.

17           Meanwhile, decisions on space science  
18 items will help address impacts from climate.  
19 These include enabling Earth exploration satellite  
20 services to explore the polar ice caps and to  
21 support greater understanding of space weather,  
22 which will help protect our satellites from harm

1       caused by solar emissions.

2               In addition, WR23 agreed on new spectrum  
3       allocations for geostationary and non-geo  
4       satellite systems, including through inner  
5       satellite links and upgraded regulatory procedures  
6       to support increased deployment of large, non-  
7       geostationary constellations.

8               We also took steps to ensure protection  
9       of radio location, radar systems, that are crucial  
10      for national defense, and identified new  
11      frequencies for aviation and maritime  
12      transportation safety programs as well as  
13      contemplated efforts related to the global  
14      maritime distress and safety system known as  
15      GMDSS. We were able to make new aeronautical  
16      mobile satellite route service allocations -- this  
17      is the aviation service -- that will support IGO  
18      standardized systems in remote and oceanic areas  
19      that lack terrestrial DHS services to the aircraft  
20      flight deck. So that's the first line of effort.

21              On the future WRC agenda items, the  
22      conference decided on an ambitious 2027 item with

1 approximately 27 items. These include studying  
2 the spectrum needed for wireless communication on  
3 the lunar surface and in between the moon's  
4 surface and moon's orbit. This will advance the  
5 goals of the Artemis Accords as we work with our  
6 partners over the coming years to establish the  
7 presence on the moon. This is a big deal.

8           The next WRC will also include  
9 additional space weather considerations along with  
10 many, many satellite issues including integrating  
11 from a spectrum perspective satellite and  
12 terrestrial wireless networks and studying other  
13 bands for what the ITU calls INT, and again, is  
14 what we know as 5 and 6G.

15           On the terrestrial side, in addition to  
16 the INT agenda items, we'll be looking at both  
17 ends of the allocation table with studies for  
18 radiolocation. These are about 230 gigahertz for  
19 wide band aeronautical systems in the high  
20 frequency range as well. And there are going to  
21 be several other potentially thorny space-related  
22 issues, including explicit agreements, and

1 equitable access. These are study questions for  
2 the next WRC, and they will need particular U.S.  
3 Attention for sure.

4           Although the future agenda item on  
5 article 22 and equivalent power flux sensitivity  
6 limits for non geo flight systems face significant  
7 opposition in their original form. We were able  
8 to compromise to ensure there will at least be a  
9 study of this issue at the ITU. We were surprised  
10 to find that, in some areas of the world, there  
11 was little understanding of the benefits of NGSO  
12 systems. We hope to work with the private sector  
13 and other federal agencies to increase global  
14 understanding of how the NGSO systems can benefit  
15 the communications ecosystem.

16           Now, for those really interested in  
17 getting into the details, the provisional acts of  
18 the WRC20 have been released and made available on  
19 the ITU website. To download it is 629 pages and  
20 makes a great stocking stuffer.

21           So with that summary, over to you,  
22 Scott.

1                   MR. HARRIS: Thanks, Coop. And to you  
2                   in particular, thank you for all of the hard work  
3                   over the last five or six --

4                   (Interruption)

5                   MR. HARRIS: Whoa, okay. So, look, I've  
6                   spent even more talking about the national  
7                   spectrum strategy and I don't see why I should  
8                   stop, right? It's working for me. So, our stretch  
9                   goal, as Alan said, was to do it before the WRC.  
10                  And I've got to admit, there were times when I  
11                  thought mentioning that stretch goal was one of  
12                  the dumber things I had ever done in my life. But  
13                  thanks to the extraordinary OSN team and our  
14                  colleagues at the White House and the federal  
15                  agencies, we met the stretch goal.

16                  I do not know if it had any impact on  
17                  the WRC, but I do know that new delegations had  
18                  actually read it before the conference began and  
19                  requested further briefings. So, it was not  
20                  unknown to the international community as the WRC  
21                  began.

22                  So what's next? The presidential



1 memorandum on spectrum. And if you have not read  
2 it yet, it is a superlative document and you  
3 really ought to look at it. There's some great  
4 stuff in there. But it gave us 120 days to  
5 release an implementation plan, described intent  
6 to meet the goals of the strategy. And we will,  
7 of course, meet that deadline. I'm not suggesting  
8 there are any stretch goals for this one though.

9           We are already putting our own thoughts  
10 together. And while we have asked for written  
11 public comments by January 2nd, we've actually  
12 already begun meetings requested by stakeholders.  
13 We got what I thought was invaluable advice from  
14 the public on the national spectrum strategy. And  
15 frankly, I expect no different here, which is to  
16 the public notice, on the implementation plan  
17 asking for input.

18           The implementation plan is going to map  
19 directly to the international spectrum strategy,  
20 and what I mean by that is this. Each pillar of  
21 the strategy had a number of strategic objectives  
22 listed under it. For each piece -- for each

1       strategic objective, the implementation on it will  
2       describe concrete steps for meeting that  
3       objective, identify the federal agency or agencies  
4       responsible for taking those steps, and the  
5       timeframes for the beginning of those steps and  
6       the completion of those steps. And it should all  
7       be laid out in the implementation plan.

8               Going back to the public input, first, I  
9       apologize for asking that written comments be  
10      submitted by January 2nd. It does make me feel  
11      like a Grinch. And I know, I've spent the last  
12      couple of weeks apologizing.

13             SPEAKER: But we're not changing the  
14      date.

15             MR. HARRIS: Right. But the deadline is  
16      so short because we have internal deadlines that  
17      we need to meet if we're going to get the plan  
18      done by mid March. And we are going to get the  
19      plan done by mid-March. This does not mean that  
20      we won't consider anything filed after January  
21      2nd. It's just that it will be maybe harder to  
22      factor in comments that come in significantly

1 after that date. So, look, do it by January 2nd.  
2 If it's January 3rd or 4th, it's not going to make  
3 any difference, but if it's much later, then we  
4 may have moved on and not be able to take them  
5 into account the way we'd like to.

6 Meanwhile, we hope soon so announce  
7 formally our next annual Spectrum Policy  
8 Symposium, which we are planning for February 1st  
9 at the National Press Club. It will feature lots  
10 of discussion of the presidential memo, the  
11 strategy, and most importantly, I think, the  
12 implementation of the strategy over the months and  
13 years ahead.

14 Finally, as Alan noted, we are soon to  
15 reconstitute this committee. We hope you will be  
16 interested in joining us again. Look for the  
17 federal register notice. It's out in the next  
18 week or two. So, we're ready to go.

19 So let me start there, turn things back  
20 to Jennifer and Charla. We have a lot to cover  
21 today. If there is time when we are done, though,  
22 both keep an eye. We'll be willing to take

1        questions about whatever. Thank you.

2                MS. RATH: Thank you, Scott. This is  
3        Charla Rath and we are going to move directly into  
4        the reports from each of the subcommittees and  
5        starting with the CBRS subcommittee, which as  
6        mentioned several times, had a lot of -- oh,  
7        sorry, Jennifer had a question.

8                MS. WARREN: Before we actually get to  
9        the substance, since Charles mentioned lunar, I  
10       want to just compliment the U.S. delegation team's  
11       lunar for the fabulous job, Charles, Ethan from  
12       the FCC, Kathy Sham from NASA, those selected  
13       teams were fabulous. It's a really historic  
14       moment, and U.S. space leadership was tremendous.  
15       So thank you for that leadership.

16               MS. RATH: Back to the regular  
17        programming, yes. Thank you, Jennifer.

18               MR. HARRIS: You can always interrupt  
19        us.

20               MS. RATH: Yes, I was just going to say.

21               MR. HARRIS: Just saying. Any time  
22        you'd like the praise the staff, we'll always take

1     it. And I'll just -- I didn't have a chance to  
2     say this directly, but yes, both the team and, I  
3     think, the broader delegation really did an  
4     outstanding job, so we're really appreciative.

5             I have a program that I'm going to have  
6     to leave shortly, but I did want to say -- I  
7     didn't want to duck out in the middle of all the  
8     reports. We love all of our children equally.  
9     But thank you for the work and it's great to see  
10    you all.

11            MS. RATH: All right. Without any  
12    further comments from me, let's move on. I think,  
13    Mariam, you said that you were going to be first  
14    up.

15            MS. SOROND: Yes, thank you. This is  
16    Mariam Sorond, and as well, congratulations to the  
17    NTIA, Assistant Secretary Davidson, and the entire  
18    staff on all of the initiative, not only the  
19    national spectrum strategy, WRC, but all of this  
20    other stuff that I followed.

21            And also, thank you for giving us very  
22    timely questions from the CBRS subcommittee. I

1 think it was very timely. It gave us an  
2 opportunity to actually bring all the stakeholders  
3 together and have a view on that when we released  
4 our report.

5 Now, with that said, also, it's one of  
6 the shortest periods of a subcommittee that I have  
7 ever dealt with, and so this is under a year that  
8 we did all of this, which is why I really need to  
9 recognize my co-chairs, Jennifer McCarthy, and  
10 Patrick's not here, Charla, Jennifer, yourself,  
11 and the incredible work that the subcommittee just  
12 did. That's just been the reason why we were able  
13 to get this report done, because everybody kind of  
14 jumped in, reached out.

15 To the point earlier made by the  
16 Assistant Secretary, this is what, you know, when  
17 you give the industry stakeholders, the regional  
18 brass, of being able to bring everybody together,  
19 it becomes incredible. So, thank you, really, to  
20 the subcommittee for the incredible work they did.  
21 And also, of course, our wonderful NTIA liaisons,  
22 Nick and Ed. Nick LaSorte and Ed Drocella have

1     been instrumental in this. And also, our FCC  
2     liaisons, Jessica and Kevin as well. So really  
3     appreciate all the work that went in.

4             So with that said, let me -- what I'm  
5     going to do is actually -- what we did over here  
6     is we're going to walk through the report to  
7     highlight. It's a short report. It's 19 pages.  
8     There's a lot of information that went in there,  
9     so we thought if we keep it at a very high level,  
10    then the fact of what we have discovered would be  
11    easier to reach. With that said, if we can move  
12    over to the introduction section, please.

13            So just as background, with the sharing  
14    increased between federal and nonfederal users,  
15    the CBRS band was one of the bands that had a  
16    sharing framework that includes three- tiered  
17    licensing spectrum that grants different levels of  
18    protection from users, including fully protecting  
19    incumbent operations of the federal entities and  
20    also the staff sort of architecture, and also an  
21    ESC network.

22            The listening framework allows for GAA

1     and PAL licenses as the (inaudible) concluded two  
2     years ago. And licenses were granted one year  
3     ago. What the NTIA asked us to do is actually to  
4     look at what was working well, what may not be,  
5     and looking at also if any of these commercial and  
6     government sharing frameworks could be used in  
7     other bands. Like any new bands, you know, there  
8     was a lot of lessons learned in here, and that's  
9     what really helped to feed the recommendation. So  
10    once I go through the reports, I'm going to hand  
11    it over to Jennifer to go in detail and to our  
12    CSMAC recommendations.

13                 So with that said, before questions from  
14    the NTIA, we could move onto that. We actually  
15    put a lot of details under this, because those  
16    details helped us bracket the different aspects  
17    that we looked at. And we looked at four  
18    particular aspects. We looked technical and  
19    sensory, policy and economics, operational and  
20    process, to standards and certification.

21                 We also did categorize the stakeholder  
22    responses -- if you could please move on to page 4



1       -- into six categories. So, we did interview 33  
2       entities formally, and there was a lot of  
3       information that was fed into the subcommittee by  
4       these members. So, with that, the six categories,  
5       one was the government stakeholders that included  
6       government operations of the bands, regulators,  
7       and labs. The second one was operators and their  
8       trade associations. The third one -- category --  
9       was SAS providers. Fourth was SDOs and industry  
10      associations. Five, equipment providers. Six,  
11      academics, researchers and individual  
12      contributors.

13               So section three takes those four  
14      categories and basically summarizes each of these  
15      six stakeholder responses that we collected at a  
16      very high level in the report. And so, what I'm  
17      going to do now is jump over to section 4. If we  
18      can go to page 14, please. Thank you, Antonio.  
19      And these are the considerations for of the  
20      implementation for CBRS and other bands.

21               So first of all, we summarized how  
22      commercial and federal sharing in CBRS can be

1 improved. The first one -- and we picked every  
2 legal one that were in the image, and we also of  
3 course highlighted the key ones outside of the  
4 majority. But starting with propagation models,  
5 this was the single most frequent sort of topic  
6 that came up amongst the federal and nonfederal  
7 users of really needing to improve the propagation  
8 model.

9           The second one was finding alternatives  
10 to the ESC. The third one was strategies for  
11 protecting incumbents while reducing unnecessary  
12 impacts of DMA events. And then the fourth  
13 sub-category of their suggestions, we did have  
14 commercial entities on the phone who did also talk  
15 about how things could be improved, for example,  
16 among the commercial entities, or how things that  
17 were not related to federal and nonfederal  
18 sharing. We actually summarized these as bullet  
19 points, as observations in the reports, so it  
20 actually captures what the industry's thinking in  
21 terms of these nonfederal and federal sharing.

22           And if you can move over to page 16. In

1 summary, there were elements of the CBRS  
2 nonfederal and federal spectrum sharing that we  
3 felt should be considered for implementation in  
4 other bands. We summarized these, and I'm just  
5 going to really review the ones that are high  
6 level. Two government respondents and two  
7 new-entrant companies, three SAS and ESC  
8 providers, an educational institution using the  
9 CBRS band for its operations, and an academic  
10 recommended that the U.S. extended the CBRS  
11 framework to other bands. Several respondents  
12 noted that while the CBRS framework provides a  
13 strong foundation of future shared bands,  
14 implementation should consider the particular  
15 characteristics of that band and its incumbent  
16 users.

17 Additionally, more broadly, a government  
18 operator recommended that the U.S. establish  
19 sharing and/or co- existence as a key priority.  
20 Several respondents recommended us to expand  
21 spectrum sharing using the CBRS framework to  
22 particular frequency bands, and these frequency

1 bands are highlighted in the report.

2 And also moving over to one of the other  
3 questions they asked us, what should be avoided?  
4 What elements of the CBRS framework or sharing  
5 regime should be avoided in other bands? On a  
6 call, two nationwide mobile wireless providers, a  
7 trade association, and an equipment manufacturer  
8 recommended against implementing a CBRS-like  
9 framework in other bands. It highlighted that the  
10 lower power levels, the smaller license areas,  
11 would actually make the band less suitable for  
12 nationwide wireless coverage and also limited its  
13 use cases.

14 Additionally, several respondents  
15 reported that the CBRS band has been successful,  
16 reporting implementing a CBRS- like framework in  
17 other bands, and also suggests changes that would  
18 produce improvements. Many respondents  
19 recommended that any future shared bands should  
20 not implement a sensing network like ESC.  
21 Government regulators noted that it would be  
22 important to extend the updates to propagation

1 models discussed in the context of the CBRS band  
2 for use in other bands. A SAS/ESC provider  
3 membered that the U.S. should make coexistence  
4 among commercial users, both GAA and PALs, in  
5 addition to coexistence between government and  
6 commercial users, a fundamental consideration in  
7 future sharing frameworks. And the FCC's part 96  
8 rules lack sufficient guidance to define and  
9 encourage such coexistence.

10 A SAS/ESC provider recommended that the  
11 FCC optimize ULS to better support shared spectrum  
12 frameworks. An association suggests establishing  
13 incentives for commercial users of other bands to  
14 report to database provider. And then finally, an  
15 equipment provider recommends establishing  
16 incentives for parties to compromise in standards  
17 bodies and industry organizations.

18 With that said, I'm going to hand it  
19 over to Jennifer McCarthy to kind of go over our  
20 recommendations for the subcommittee.

21 MS. MANNER: Thank you, Mariam. Ms.  
22 McCarthy. And congratulations and thank for your

1 leadership in this subcommittee and everyone who  
2 contributed. This was really a heroic effort.  
3 And just the sheer number of entities we  
4 interviewed was both impressive, a lot of work,  
5 but I think, very rewarding in the end. So, thank  
6 you everyone who helped make that happen and for  
7 everyone who drafted and pulled this thing  
8 together. It was great.

9           So in terms of the subcommittee's CSMAC  
10 recommendations at a high level, I think that the  
11 CBRS band has provided a unique opportunity to  
12 allow various nonfederal entities to coexist with  
13 federal incumbents without creating any  
14 interference with those incumbents. That's been  
15 the biggest lesson learned here is that spectrum  
16 sharing, dynamic spectrum sharing, can happen. It  
17 works. And that the incumbent users are  
18 adequately protected. And at the same time, the  
19 hybrid licensing framework has permitted a wide  
20 range of use cases across a whole myriad number of  
21 fixed mobile wireless operators and enterprise use  
22 cases. And this is a growing band for hundreds if

1 not thousands of new users, which I think is also  
2 an exciting component of this enabled by the  
3 licensing framework and the dynamic sharing  
4 capabilities.

5 Moving on, we did make some specific  
6 recommendations on how the CBRS framework and the  
7 specific processes and rules could be improved.  
8 From a process perspective, we recommended that a  
9 new process be created so that all federal,  
10 commercial, and other government stakeholders are  
11 able to drive timely improvements to the rules, to  
12 the operational settings, and to the standards as  
13 necessary.

14 We're hoping that this process might  
15 inform the soon-to-be-created Interagency Spectrum  
16 Advisory Council that's mentioned in the national  
17 spectrum strategy. And that this process should  
18 consider holding quarterly policy group meetings  
19 to bring all of the stakeholders together. And  
20 that we need folks who are able to take  
21 deficiencies and make sure that these improvements  
22 are implemented in a timely manner. And that this

1       should be reoccurring and a regular set of  
2       meetings so that there's an expectation that we  
3       don't do a one-and-done activity. We need to  
4       constantly be looking for opportunities for  
5       tweaking, optimizing, improving.

6               To the extent that this CBRS framework  
7       is adopted for other frequency ranges, obviously,  
8       we would want to --

9                       (Interruption)

10               We'll need to tailor the framework to fit  
11       the band circumstances and the incumbent situation.  
12       And we may need to adjust which stakeholders are  
13       brought into those conversations. But we do think  
14       that this is a good framework that should  
15       considered for other bands and adapted as  
16       appropriate.

17       We also made a whole series of specific  
18       recommendations on technical issues, some of which are  
19       already under consideration within various working  
20       groups between the CBRS community and the federal  
21       government. This includes updating the model and  
22       methodology used in propagation calculation. It also



1 includes reducing the heartbeat interval in non-DPA  
2 areas and reducing the DPA activation timer. All of  
3 these are actively being studied today between the  
4 federal government agencies and the CBRS community.  
5 There are a whole host of other technical  
6 recommendations, including reducing the DPA  
7 neighborhood sizes, reducing the complexity of the  
8 aggregate interference calculation protection so that  
9 we're not requiring so much compute power and SAS  
10 coordination. We also want to find ways to possibly  
11 reduce the reservation of excessive, unnecessary  
12 amounts of spectrum for excessive lengths of time so  
13 that commercial users have more consistent access to  
14 the band whenever possible. And then also to improve  
15 notification of scheduled use of the band by federal  
16 agencies to the extent that is practical.  
17 One of the other technical issues that we're  
18 recommending is that NTIA study the impact on federal  
19 operations of a possible increase in the EIRP levels  
20 by commercial users and understand whether or not that  
21 would be feasible from the federal perspective. We  
22 also are recommending we automate the sharing

1 mechanisms so that we have a minimal amount of human  
2 intervention that's necessary in order to make CBRS  
3 spectrum sharing possible.  
4 And then finally, we recommend that NTIA advocate to  
5 ensure that impacted federal agencies are adequately  
6 funded to support the ongoing spectrum management and  
7 sharing activities. Again, this is not a "let's study  
8 it once upfront and be done with it." This is going  
9 to require ongoing participation and analysis and  
10 that's going to require additional funding to make  
11 sure that's done over time.  
12 So thank you and that's it. Yeah, thank you. Paul  
13 Margie.

14 MR. MARGIE: I had a question. As a  
15 member of the subcommittee, first off, thank you  
16 to the leadership of the subcommittee. You guys  
17 did a great job in a very small amount of time  
18 with a huge number of interviews. So that was  
19 really appreciated as being on the subcommittee.

20 I'll just say from my perspective, I  
21 think there are three big things here for NTIA.  
22 Number one is that the CBRS band was not just

1     about trying to have one band open for commercial  
2     services. It was about giving you a tool so that  
3     you could have a way of protecting federal  
4     services and allowing commercial services at the  
5     same time without displacing federal services.  
6     And I think what the subcommittee's report here  
7     shows is that you've got that. There was a wide  
8     understanding that there has not been reported  
9     interference with federal systems and you've got  
10    robust commercial service. And that's a big  
11    victory outside of these particular frequencies.  
12    So that's number one.

13                 Number two is I think you see as these  
14    tools mature, you're starting to see ideas for  
15    making them even better. But those ideas for  
16    making them better are not about some finding that  
17    the mechanism itself has problems. It's about  
18    going from good to excellent. And I think you've  
19    got some specific ideas that you could do there.

20                 And then the third one is outside of the  
21    bands completely. It's from a whole different  
22    subcommittee, again and again and again,

1 propagation models. And this is a place where I  
2 think NTIA and the expertise you guys have could  
3 make a contribution across all the bands by saying  
4 it's time for us to take a hard look at our  
5 propagation models, and that'll be a common good  
6 that your technical kind of leadership could give  
7 to the whole community. So, those are the three  
8 big takeaways for me.

9 MS. MANNER: Jennifer Warren, please.

10 MS. WARREN: Yeah, I can't get this  
11 thing to stand. So, I want to echo Paul's comments  
12 to the leadership team. It was a marathon in a  
13 sprint. That said, it was great. I think all of  
14 us learned a lot. I would at least echo one part  
15 of Paul's comments, which is the first part, which  
16 is it shows us a very forward leaning approach to  
17 spectrum sharing or coexistence that needs to be  
18 explored further. A fairly simple band compared  
19 to next level bands that, you know, may want to be  
20 studied. And there's much more complexity. So, I  
21 refer to it as we need to look at what would be  
22 the next generation level of CBRS or low-power

1 capabilities to coexist.

2 But I think it proves that coexistence  
3 can be done. You don't have to adhere to the  
4 past. We need to look ahead. And these are new  
5 methods for trying to find coexistence. So, again,  
6 I learned a lot through these interviews, so kudos  
7 to the process which you guys set up. So, thank  
8 you.

9 MS. MANNER: Thank you, Jennifer. It  
10 looks like we have another comment from Rikin.

11 MR. THAKKER: I just want to echo  
12 everything that's been said, but I do have a  
13 question. And that's for Scott. I know the  
14 implementation plan written comments are due by  
15 January 2nd, questions in general, because this  
16 committee has a lot of recommendations and  
17 spectrum sharing dynamics, how it works and how  
18 it's sufficient. How this work would be evaluated  
19 for the implementation plan?

20 MR. HARRIS: (inaudible)

21 MR. THAKKER: Okay. All right. Yes.  
22 It's you have to admit, it's a lot of

1       recommendations, yeah. Thank you.

2               MS. MANNER: Is there anyone on the  
3       phone who would like to make a comment or have  
4       questions for the subcommittee chair?

5               MR. CALABRESE: Yes, this is Michael  
6       Calabrese. Can you hear me, okay?

7               MS. MANNER: Whoever that is, there's  
8       a tremendous amount of interference that's coming  
9       through.

10              MR. CALABRESE: Yeah, okay, never mind.  
11       I don't know why.

12              MS. MANNER: Michael, if you -- I  
13       mean, I suppose one thing you could do is type it  
14       into an email and we could read it off. But -- we  
15       could hear your voice in the background, but there  
16       was a tremendous amount of interference. So, I  
17       think what we're going to have to do -- actually,  
18       you know what? If you want to do that, Michael,  
19       could you just indicate by quickly coming online  
20       again? And if not, we're going to move to a vote.

21              All right, well I would say that means  
22       we're moving to a vote. And for those of you on

1 the phone with the exception of Michael, please  
2 unmute your phone that we can, you know, hear you,  
3 you know, your vote first. And all those in favor  
4 of adopting the report, please signify by saying  
5 aye or yes.

6 Okay, we know Michael is in favor.  
7 Anyone opposed?

8 MR. RICHARDSON: Actually, that was Dale  
9 Hatfield.

10 MS. MANNER: Oh, that was Dale too,  
11 okay. And --

12 SPEAKER: So, it's the West Coast that's  
13 the problem.

14 MS. MANNER: -- any abstention? All  
15 right, well, congratulations. It has been  
16 accepted and is now a CSMAC report. Great.

17 MS. SOROND: Thank you. Sorry, this is  
18 Mariam again. I just -- and I think you know who  
19 you are, listening in this room. Thank you so  
20 much for the subcommittee members. I did not name  
21 the ones who really put in a lot of effort, but I  
22 loved it. Thank you again for doing this. It was

1 fun.

2 MS. MANNER: Thank you so much. And  
3 so moving onto our next report of 6G. And  
4 Carolyn, I believe you're going to present for us.  
5 So turning it over to you, please. Thank you.

6 MS. KAHN: To hear about all these  
7 afternoon developments and these outcomes and  
8 results that are being achieved. And in  
9 particular with 6G, we appreciate the question and  
10 that you are taking a very forward-looking future  
11 look at this, which I agree, it's not too early.  
12 It is very timely. So, appreciate that. So, Reza  
13 and I will be presenting our report on the 6G  
14 subcommittee including the update since our last  
15 fall CSMAC meeting as well as our final reporting  
16 recommendations.

17 So big appreciation to all of our  
18 subcommittee members. Like others have said, I  
19 mean, your expertise and different perspectives  
20 were critical to us achieving our report and  
21 recommendations. And through the interviews we  
22 conducted, we held very insightful discussions.



1     We were able to make developments and make  
2     advancements beyond what is out there already. So  
3     really appreciate.

4             As well, again, I would like to thank  
5     Rich Orsulak, (phonetic) our NTIA liaison, Antonio  
6     Richardson, our designated federal officer. You  
7     guys were very prompt with answering all of our  
8     questions throughout, and that really was critical  
9     to our subcommittee running smoothly, so thank  
10    you, NTIA. And appreciate the liaison from FCC.  
11    That collaboration is so important. So, thank you  
12    for your participation.

13            (Interruption)

14            MR. RICHARDSON: Dale, if you can hear  
15    me, can you please put your phone on mute? Never  
16    mind, I put you on mute.

17            MS. KAHN: Okay, so our next slide show,  
18    these are the study questions that NTIA provided  
19    us that we started off in August of 2022. Our  
20    study questions, there are two parts to our  
21    questions. The first one is asking about 6G use  
22    cases, particularly those beyond traditional

1        wireless. And then also about what spectrum bands  
2        could be used with 6G, including terahertz bands.  
3        We looked at other bands as well and NTIA asked  
4        about the expected impact to government users.  
5        And what we can recommend to help government users  
6        prepare for 6G. And then again, other spectrum  
7        bands that could be appropriate for 6G.

8                Next slide. So, when we felt -- we  
9        scoped our work accordingly and developed an  
10       outline. And actually, going back to look at the  
11       report that we developed, we're very closely  
12       aligned to the outline that we initially  
13       established. Maybe we moved, you know, reordered  
14       a couple of the sections, but it is very close.  
15       So happy to, you know, achieve what we had  
16       initially set off. And we were very ambitious  
17       when we started too, with people wanting to add  
18       different sections.

19                So we collected key reference materials,  
20       conducted interviews across government, industry,  
21       academia, and other non-profit organizations. And  
22       so again, this is a way to get original new

1 information to advance this area. And that was  
2 extremely helpful. And we really appreciate all  
3 of the organizations and people that we  
4 interviewed. Very valuable.

5 We held many subcommittee meetings every  
6 couple of weeks, so over 25 subcommittee meetings.  
7 And this was very significant because our  
8 cross-sectional viewpoint perspective and  
9 collaboration helped to get our reporting  
10 recommendations and advance the area.

11 Okay, so now I will turn to over to Reza  
12 for summary of the updates since our last CSMAC  
13 meeting.

14 MR. AREFI: Thank you, Carolyn. Reza  
15 Arefi. Things are left since we started meeting  
16 beginning in September. There're a few things. We  
17 updated our draft report, which we will talk about  
18 it a little bit later.

19 MS. MANNER: Excuse me, Reza, is your  
20 microphone on?

21 MR. AREFI: Yes.

22 MS. MANNER: Okay.

1                   MR. AREFI: Am I too soft? Okay. So, we  
2     collected the feedback from the last meeting.  
3     Also from the CSMAC members as well as there were  
4     some public comments that came in last time in  
5     September. And we incorporated those into the  
6     report to the best of our ability. We also  
7     included material with respect to national  
8     spectrum strategy, which came out after the  
9     September meeting. And also, some updates from the  
10    ITU incorporated. There was also an added  
11    reference section. And also worked on refining  
12    our recommendations at the end for better clarity  
13    and comprehensibility.

14                  Next slide. The report -- yeah, this  
15    slide has the outline of the report. We started  
16    with presenting a vision of 6G, a vision of the  
17    way the subcommittee looked at it. And we also  
18    looked at the overview of how everyone else around  
19    the world looked at 6G and their vision of this.  
20    The report is available. It turned out to be  
21    quite comprehensive. To be honest, in the  
22    beginning, at least myself, I wasn't sure how much

1     useful material we could put in there given that  
2     6G is many years away, but it turned out to be  
3     actually quite comprehensive and a good read.  
4     Stocking stuffer.

5             Anyway, we approached the use cases by  
6     looking first at key application drivers. And  
7     then we followed -- we went through a long list of  
8     potential use cases of 6G and identified those who  
9     have been more -- considered more seriously.  
10    These came out of a lot of interviews that we  
11    conducted as well as material from all around the  
12    world, all of the research and activities that are  
13    going on around 6G and definition.

14            Let me focus on potential use of 6G by  
15    federal government users and look at technologies  
16    and capabilities of 6G. And from there, we moved  
17    on to potential spectrum bands for sporting 6G and  
18    what would be the potential implications to  
19    government users who are incumbents through bands.

20            We also briefly talked about -- in the  
21    report, we talked about the international  
22    considerations and summarized our findings. And

1       that leads us to our recommendations, and they're  
2       in two sets: One to help prepare for impact  
3       government users and also some of general  
4       recommendations.

5               The recommendations are basically in  
6       three sets. Recommendations to help government to  
7       prepare for impact of 6G to their operation. And  
8       our other recommendations are divided into  
9       recommendations on use cases and recommendations  
10      on (inaudible) And now, Carolyn goes through some  
11      of the recommendations.

12             MS. KAHN: Okay, great. So, this first  
13      set, like Reza said, so these are recommendations  
14      to help prepare for the impact to government  
15      users. And it doesn't include operational impact  
16      based on the scope of the question, so getting  
17      that out up front.

18             So first, we recommend that NTIA work  
19      with FCC and the agencies to build in spectrum  
20      sharing plans and designs early on so that it's  
21      not an afterthought, but it becomes part of the  
22      development and this is thought on early on and

1 throughout the process. We recommend NTIA engage  
2 with federal incumbents, particularly in bands  
3 that are of interest and getting attention for 6G  
4 to better understand its use and its ability to  
5 share.

6 We also recommend NTIA work with FCC to  
7 leverage more data-driven, automated, and dynamic  
8 methods for sharing, such as leveraging division  
9 of the IIC and use of schedulers. And then our  
10 second recommendation here is recommending NTIA  
11 work with FCC, the agencies, White House, and  
12 Congress, to consider ways to incentivize and  
13 encourage all users of spectrum to use spectrum  
14 more efficiently and effectively. So, incentives  
15 such as with agencies on the acquisition side with  
16 acquisition reform as well as commercial industry  
17 incentives there, so that all users can use  
18 spectrum as efficiently as possible.

19 Next slide. Okay, so then this batch of  
20 recommendations, so these are overall CSMAC  
21 recommendations. And we recommend that NTIA  
22 prioritize a long-term spectrum planning. We know

1       that NTIA and agencies and all organizations,  
2       there's immediate needs that are required on a  
3       daily basis, but also important is dedicating time  
4       to the long-term planning. So, we recommend that  
5       that is prioritized. And we suggest it could be  
6       coordinated through the newly established  
7       Interagency Spectrum Advisory Council and could  
8       also be incorporated into their charter to work on  
9       long-term important matters.

10               Then our second recommendation is that  
11       we recommend that NTIA consider continuing a 6G  
12       subcommittee for the next term of CSMAC to  
13       continue to look at these issues, because it will  
14       continue to advance and mature so that it can  
15       continue getting attention.

16               The next slide. So NTIA, we recommend  
17       NTIA work with agencies also such as through the  
18       Interagency Spectrum Advisory Council to continue  
19       to identify 6G use cases for federal government.  
20       And in particular, to characterize the  
21       differentiated needs, so what unique requirements  
22       federal agencies have for 6G compared to industry



1 and to work with industry and trade associations  
2 to address federal agency requirements.

3 And our fourth recommendation is we  
4 recommend that ITS could be leveraged to develop  
5 federal agency cases. And so, seeking funding to  
6 allow that in partnership with the agencies, and  
7 all of this in alignment with ITU timelines, which  
8 is important that's being advanced.

9 Reza, over to Reza for spectrum  
10 recommendations.

11 MR. ARIFI: Yes, thank you, Carolyn.  
12 Reza Arefi again. On spectrum, our first  
13 recommendation on spectrum is related to preparing  
14 for the impact to 6G of government users, and our  
15 recommendation is for the FCC and federal  
16 agencies, White House, Congress, to all  
17 proactively help and prepare for this specific  
18 impact as we saw on slide 8.

19 Second recommendation is with respect to  
20 spectrum compendium. The recommendation here is  
21 to drop the compendium, the spectrum compendium,  
22 with additional and more detailed, more granular

1 data, for instance on location and time of use as  
2 much as possible. And describing the uses and  
3 extending its compendium above the current limit  
4 of 7125 megahertz to at least into the  
5 sub-terahertz and 95 gigahertz range.

6           The third recommendation, which is, at  
7 least in my view, a very important one. And  
8 that's adopting a toolbox approach to spectrum  
9 sharing instead of basically waiting for finding a  
10 universal cure-all kind of approach to spectrum  
11 sharing to try to match sharing approaches to  
12 specific conditions like customizing sharing  
13 techniques to frequency bands and a range of  
14 incumbent systems, including commercial  
15 incumbents. And considering the requirements of  
16 all commercial services in that process. Also,  
17 specifically in terms of sub-terahertz ranges,  
18 maybe considering less management given the  
19 propagation and all the impediments that  
20 propagation in those frequencies face. And all  
21 the could help enable sharing in those  
22 frequencies.

1           And the last recommendation, again, with  
2   respect to the sub-terahertz spectrum, maybe for  
3   the FCC to facilitate innovation in those ranges  
4   by providing additional exploratory mechanisms  
5   such as labor or possible additional licensed  
6   spectrums in addition to the spectrum license that  
7   are now available. And that would be helpful in  
8   diving into a new opportunity in those frequency  
9   bands.

10           And at the end, there's also recognition  
11   that NTIA and federal agencies would need more  
12   resources to participate more effectively in  
13   helping to prepare for 6G's impact to government  
14   users. And incorporating next generation federal  
15   agency requirements and advanced and tailored  
16   sharing approaching to specific situations. In  
17   this case, CBRS is a good example. This  
18   recommendation is not to repeat CBRS in every  
19   band, but to take the same kind of approach and  
20   think out of the box and try to find the best  
21   solution for each band given the incumbents of  
22   each band.

1                   And that's our last slide. Thank you.

2                   MS. KAHN: Okay, thank you so much. So  
3                   what I would say only because we have people on  
4                   the phone, let's start with people in the room.  
5                   If anyone has any questions or comments. I see  
6                   Donna, please. Thank you.

7                   MS. BETHEA-MURPHY: Thanks. Donna  
8                   Bethea-Murphy. I appreciate all the work done by  
9                   this committee, especially, you know, the seeds  
10                  needed after some of the ITU recommendations or  
11                  visions that have come out. I noted the idea of  
12                  continuing with this committee. And since there  
13                  was so much work done, maybe the thought would be  
14                  start a year into the next session, because  
15                  otherwise, we've done a lot of the work. And I'm  
16                  not sure what the committee would do at the  
17                  beginning if there are not very specific things  
18                  that are coming out of the WRC, those will  
19                  probably be studied as a very specific matter in  
20                  the next CSMAC session. So maybe one idea would  
21                  be to have it updated at the second half of the  
22                  next CSMAC. Thank you.

1                   MS. MANNER: Thank you, Donna. Anyone  
2                   else in the room? Okay, I'm going to ask -- maybe  
3                   we can do a test just with Dale. Dale, could you  
4                   unmute and just can we see if we can hear you  
5                   without the static, please?

6                   MR. HATFIELD: Yes, I can hear you.

7                   MS. MANNER: Okay, that didn't work. That  
8                   was familiar. That's why you don't have lawyers  
9                   do these things, Dale, as you know. But sorry  
10                  about that. Oh, so Dale, if you can, stay muted  
11                  please. I'm sorry about that.

12                  Is there anyone else? Because if Dale  
13                  or Michael want to make a comment, if you could  
14                  email us, that would be great. But is there  
15                  anyone else on the phone who has any comments?  
16                  Okay, I'm sorry about the technological  
17                  difficulties.

18                  So with that, I'd like to move the  
19                  report forward for a vote.

20                  MR. AREFI: Can I ask for a  
21                  clarification? Are we also voting on the  
22                  recommendation of a carry-over or just the

1 technical recommendations of the report? Because  
2 I think that's a very distinct -- and usually our  
3 work is based on what NTIA wants.

4 MS. KAHN: Yeah, so I was assuming we  
5 were voting on the report, not Donna's  
6 recommendation.

7 MR. AREFI: No, no, no, the  
8 recommendation of carry- over, which was in the  
9 report --

10 MS. KAHN: So, I would turn to Antonio  
11 how he would like that handled.

12 MR. DOMBROWSKY: Yeah, it's kind of up  
13 to the committee, right? It's part of the  
14 recommendation. I would think if both wanted to  
15 concur with the report, but no, maybe they don't  
16 agree with maybe one aspect, they could, right?  
17 It is part of the report.

18 MS. MANNER: Okay, that is a very  
19 important clarification. So, I'm going to ask for  
20 approval --

21 (Interruption)

22 I'm going to ask -- so if we could, stay

1 muted on the phone for right now. So, I'm going to  
2 ask for approval of the report and then I'm going  
3 to ask **simulate** if there's any separate statement,  
4 anything on that specific recommendation, to  
5 continue CSMAC. But I want to have the report  
6 approved overall and then we can have a separate  
7 statement, if that makes sense to everyone. I see  
8 people shaking their heads. So, and I'm hoping  
9 Michael and Dale will email if they have any  
10 concerns. But any objections to report moving  
11 forward?

12           Seeing none. And any statements that we  
13 want to capture for the record on the  
14 recommendation that this be continued into the  
15 next period? I know Jennifer Warren wants to, so  
16 I'll give it over to Jennifer, please.

17           MS. WARREN: So, I fully support the work  
18 of the group, but I think that there should be --  
19 we usually defer to NTIA to come back to us with  
20 what their priorities are and let me them  
21 determine, after they digest the report, what they  
22 would have be their priorities. So, I would like

1 to decouple, even though I approved the report in  
2 this process, I would like to make a motion that  
3 we -- well, how would we do this? I would like to  
4 note, I guess, an abstention at least from that  
5 part of it to say that this continue. I think  
6 that should be at the discretion of NTIA as to  
7 what would be useful when and their own  
8 priorities.

9 MS. KAHN: Thank you. Give me --

10 MS. WARREN: I don't know how to phrase  
11 that.

12 MR. THAKKER: Yeah, I'm somewhat  
13 confused on that discussion, because I think that  
14 was the intent that we make recommendation to NTIA  
15 that since six years, no vision or use cases have  
16 been defined, this work needs to continue, but of  
17 course through a new charter, right? That was the  
18 idea behind that. And that's why it's part of the  
19 recommendation there, all of the recommendations.

20 MS. MANNER: Thank you. And Mariam,  
21 please.

22 MS. SOROND: Yeah, I think this is a



1 recommendation to the NTIA. It is not a final  
2 approval that this happens, right? And the NTIA  
3 could decide to do or not to do it. I don't think  
4 we can determine the recommendation itself. It's  
5 still within the NTIA --

6 SPEAKER: Clearly, we need more lawyers  
7 on the NTIA and less engineers. That's what I'm  
8 taking from this discussion.

9 MS. MANNER: Maybe I can come up with a  
10 way forward. So, I think we've approved the  
11 report. There were some notes made by parties to  
12 consider not starting a CSMAC on 6G from Donna for  
13 another year or so into the charter and Jennifer  
14 also noting that this is really in the discretion  
15 of NTIA. So, I think with that, we have the report  
16 approved, which is the most important thing and  
17 the hard work that the entire group did and, of  
18 course, our co-chairs.

19 MS. ALVAREZ: Did you call for a vote?

20 MS. MANNER: I did. We voted.

21 SPEAKER: Can I have a moment here --

22 MS. MANNER: I think -- yeah, we voted

1       already.

2               SPEAKER: Dale, can you try and speak  
3       one more time, please?

4               MR. HATFIELD: I'm sorry?

5               SPEAKER: I was asking you to try and  
6       speak to us one more time. For some reason,  
7       you're coming in really loud. If maybe you can  
8       turn your volume down, you won't be --

9               MS. MANNER: I think it's actually -- so  
10       we're going to assume that there's -- I got an  
11       email from Michael Calabrese as well. Just an  
12       announcement. Yes, on the report no on setting the  
13       agenda for the next annual CSMAC. So, I think just  
14       noting that we talked about. So let me move on  
15       because we're spending way too much time on -- I  
16       think we have full agreement -- and turn over to  
17       Charla.

18              MS. RATH: Thank you. Thank you,  
19       Jennifer. This is Charla Rath. And I am turning  
20       it over to Tom, who will be starting the report on  
21       the NTIA subcommittee.

22              MR. DOMBROWSKY: I'll wait for Antonio

1 to -- I'll wait for the magic man to magically  
2 make the presentation show up on the screen. But  
3 the NTIA subcommittee, you won't see a whole lot  
4 of changes from the September timeframe. We added  
5 another, additional recommendation. We really had  
6 some editorial changes to the final report. But  
7 for the most part, what we talked about in  
8 September, you're going to hear about it again today.  
9 So feel free to tell us to stop droning on. And  
10 we recognize we are the last report before the  
11 end. So, we will go as quickly as we possibly can  
12 because I'm sure you really want to hear us say  
13 the same things over and over again.

14           If you could, go to the next slide,  
15 Antonio. I just wanted to commend our  
16 subcommittee. We have a 40-plus page report. It  
17 wouldn't have happened but for the fact that every  
18 member contributed in some fashion. Similar to  
19 other groups, we did start with an outline, and  
20 people volunteered and created a lot of good  
21 content. And I feel like this subcommittee's  
22 final report has a lot of good information for

1       folks and a lot of good recommendations for NTIA  
2       to follow through on. So, I'll just leave it at  
3       that in terms of -- pretty happy where we came out  
4       on this one.

5               On to the next slide, Antonio. I'm not  
6       going to repeat the questions to everybody. We've  
7       done this three or four times at this point. But  
8       just note that we were really looking at  
9       aeronautical radar coexistence with terrestrial  
10       commercial wireless systems, and that was the  
11       basis of what our work was. We were not doing any  
12       analysis. We were just giving people some ideas  
13       and thoughts on how you could actually do that.

14              And on to the next slide, Antonio. As  
15       we noted before, we had regular monthly meetings.  
16       We did meet a few times, more than once in a  
17       month, especially as we got closer to meetings.  
18       But in general, we were meeting on a regular  
19       basis. We had a series of five different  
20       interviews with the federal agencies and with the  
21       manufacturer/vendor partners that were  
22       knowledgeable about the radar systems. And we had

1 a draft report agreed to by the subcommittee and  
2 then provided the full CSMAC back in October,  
3 about the second week of October. So, everybody  
4 should have seen it well in advance of this  
5 meeting.

6 And then today, we have the final report  
7 for voting here today. It tracks very much what  
8 was shared with everybody back in October, like I  
9 said, with just a few editorial changes. And I'll  
10 let Donna talk through the overview of the draft  
11 report before we get into the recommendations.

12 MS. BETHEA-MURPHY: And as was mentioned  
13 by Tom, we were looking at aeronautical radar  
14 systems, specifically in the 5 to 16 gigahertz  
15 frequency range. And we were very clear about  
16 that throughout the report. And we discussed the  
17 vendors we met with, Garmin, Collins, NASA, FAA.  
18 We talked about the wireless coexistence modeling.  
19 I think a number of groups have talked about the  
20 parameters that could be used and identifying the  
21 mutually acceptable values.

22 We looked at the coexistence analysis.

1     We described the parameters and how they should be  
2     considered. We talked about the types of inputs  
3     that were needed for statistical analysis and  
4     discussed how these could be used by federal  
5     agencies and applied to coexistence modeling.  
6     Again, I think we're hearing a lot about the  
7     importance of modeling and getting it right.  
8     We're sort of starting at a higher level and  
9     making it more accurate, which is what the next  
10    bullet talks about.

11             And we discussed potential approaches  
12    for the coexistence analysis and about how these  
13    will improve over time, right? Again, you start  
14    with one model and you continue to refine, which  
15    gets a better sharing mechanism.

16             We talk about the role of NTIA and  
17    making sure that there's full representation of  
18    the agency views and concerns so that there can a  
19    coordinated view with the FCC. And talking about  
20    the need for collaboration between the agencies  
21    and the private sector.

22             And finally, we talked about

1 enforcement, because when you're looking at  
2 compliance and coexistence, there has to be a way  
3 to identify and mitigate interference and deal  
4 with the issue of compliance.

5 MR. DOMBROWSKY: And then on to the  
6 recommendations part. The first ten will be  
7 exactly the same as what we talked about in  
8 September, so no surprises here. But the first  
9 recommendation is really about how do we set up a  
10 collaboration process? And recommending that NTIA  
11 working with the FCC set up that routine process  
12 early in the decision-making process. Use of  
13 models and analysis, developing guidelines for  
14 those analyses, and making sure they're repeatable  
15 and publicly available is very important. And we  
16 did pull a lot from other federal agencies that  
17 have used statistical analysis, not necessarily  
18 for RF, but a lot of lessons learned that could be  
19 used in the same way in the RF environment.

20 And then finally about being  
21 transparent, if you're going to have this process  
22 and people are filing information, that should be

1 publicly available to the extent it's nonsensitive  
2 data, and make sure that everybody's understanding  
3 how the process is working.

4           Onto the next one. Do you want to do  
5 the next one? Do you want me to do it?

6           MS. BETHEA-MURPHY: Sure. You could do  
7 one more.

8           MR. DOMBROWSKY: Okay. On to  
9 recommendation four, we have coexistence analysis  
10 updates. So, making sure that you're not sort of  
11 fixing people in time, you've made a decision and  
12 you're stuck with it forever. So, making sure that  
13 can evolve, an important thing that's part of this  
14 process. Factoring in risk measures, translating  
15 RF realm into interference and into risk measures  
16 as to how people can tolerate interference when  
17 you're modeling this and what the likelihood is.  
18 And what the acceptance of that kind of risk is,  
19 depending on the use case and the federal agency  
20 requirements and/or the commercial requirements.

21           And as was said, and I think the other  
22 two committees as well, propagation model



1 improvements. I think everybody is on the same  
2 page there. We've got some uniform  
3 recommendations coming in about the need to update  
4 propagation models, because we're getting into  
5 frequency bands that we just don't have  
6 propagation models. And frankly, NTIA and ITS has  
7 the best skill set to actually do that. So, making  
8 sure we improve the process and making sure  
9 there's a working group set up between the private  
10 sector and the federal agencies to actually work  
11 on propagation.

12 On to the next slide.

13 MS. BETHEA-MURPHY: Okay. We recommend  
14 an inclusive analysis. Again, this means that all  
15 the federal agencies come together to be able to  
16 present a unified view when coordinating with the  
17 FCC and to facilitate direct discussions between  
18 nonfederal and federal entities to work out the  
19 technical analysis.

20 Recommendation 9, interference  
21 mitigation. We think it's important to be able to  
22 identify resources or mechanisms to locate

1 accurately and expeditiously mitigate harmful  
2 interference. I think this is a function that has  
3 really sort of tapered off over the last few years  
4 in all the agencies, and our recommendation is  
5 it's something that needs to be ramped up again to  
6 make a better sharing scenario.

7 Enforcement of coexistence arrangements.  
8 So we recommend that NTIA with the FCC develop and  
9 identify enforcement activities and mechanisms  
10 necessary to ensure compliance and spectrum  
11 coexistence.

12 And then finally, compliance penalties.  
13 We recommend that NTIA works with the FCC to  
14 establish penalties for not complying with the  
15 coexistence arrangement.

16 MR. DOMBROWSKY: And that completes our  
17 report. As I said, most of it's pretty repetitive  
18 from September. We apologize for being  
19 repetitive, but you know, that means we maybe did  
20 a good job and didn't have to make a lot of  
21 changes by December. That's the way I'm going to  
22 look at it.

1 MS. MANNER: So, looking around the room,  
2 are there any questions or comments for these two  
3 co-chairs? Thank you. On the phone, anyone --  
4 other than Dale. And Dale, if you have comments,  
5 I've got my email. If you could, just send them.  
6 Anyone else have comments? Ah, Jennifer, Jennifer  
7 Warren, thank you.

8 MS. WARREN: So really good report.  
9 Again, I commend the team. One comment is just to  
10 NTIA. I know a lot of the time we use the term  
11 industry. We're including not just the commercial  
12 wireless industry but the manufacturers of the  
13 aeronautical radar equipment, and that's always --  
14 it's not spelled out everywhere, but --

15 MR. DOMBROWSKY: But for us, we  
16 understand that fully, just to be clear.

17 MS. WARREN: That's what I was  
18 emphasizing in public that that was intended to --

19 MR. DOMBROWSKY: Yes, we agree  
20 completely.

21 MS. WARREN: Okay. Thank you.

22 MS. MANNER: And thanks for pointing that

1 out. You're absolutely right. Thank you,  
2 Jennifer. Any other comments before we move to a  
3 vote? So, all in favor of adopting the ECI  
4 subcommittee report, say aye.

5 Anyone opposed? Actually, I'm assuming  
6 with the ayes, but anyone opposed? Is that Dale  
7 again?

8 SPEAKER: That's someone else now.

9 MS. MANNER: Okay. I hope it's not  
10 somebody on the committee trying to make a  
11 comment. Can you tell --

12 SPEAKER: So, if I may have just a quick  
13 chat with Jennifer Manner.

14 MS. MANNER: Yes, Jennifer here.

15 MS. MANNER: Was that Jennifer?

16 SPEAKER: Jennifer?

17 MS. ALVAREZ: Yes, I'm here.

18 SPEAKER: That's Jennifer there.

19 MS. MANNER: Was she the one trying to  
20 comment?

21 SPEAKER: No.

22 MS. MANNER: Okay. All right, well, we

1       were in the midst of a vote. I'll say any nays  
2       again? And then any abstentions? So, the report  
3       has been adopted. Before I turn it over to  
4       Jennifer, I just wanted to make a comment. I've  
5       not been doing this as long as some of the people  
6       on committee, and I'm looking at a few people and  
7       also looking at people on the phone. But I don't  
8       think I've ever seen as many recommendations come  
9       out of -- I've seen where we'll have one report,  
10      we'll have a lot of recommendations. But every  
11      single committee has given you and you and you a  
12      lot to think about and a lot to consider. So be  
13      careful what you ask for, I guess, is what I  
14      should be saying.

15                Anyway, over to you, Jennifer.

16                MS. MANNER: So, thank you. So, I want  
17      to do -- before moving on, we wanted to give --  
18      and I hate to say this -- an opportunity for --

19                       (Interruption)

20                Okay, I don't think we can do the  
21      opportunity for public comment, Antonio, because  
22      I'm very sensitive to noise, and you'll have to --

1                   MR. RICHARDSON: Try it one more time.

2           I think we'll be okay.

3                   MS. MANNER: Is there anyone from -- is  
4           there anyone from the public who wanted to make  
5           any comments? Thank you for being quiet. You  
6           could email me later and we'll answer your  
7           comments.

8                   And so before I turn it over to closing  
9           remarks, Charles and Scott volunteered to take  
10          some questions from members of the committee. So,  
11          we wanted to not pass on this very special  
12          opportunity. Oh, and Karl is first in line. No  
13          surprise there. But we wanted to say -- I knew he  
14          had a question coming in. So, if you're interested  
15          in doing that, just put up your temp card. And  
16          we'll start off with Karl, please, Karl Nebbia.

17                   MR. NEBBIA: Karl Nebbia. I just wanted  
18          to ask, what do you see as the difference between  
19          the Interagency Spectrum Advisory Council and the  
20          PPSG?

21                   MR. DOMBROWSKY: So, the PPSG is going to  
22          be phased out. And it's going to replace it and

1       it's intended to be more senior officials. We --  
2       the presidential memorandum gave us 90 days to  
3       draft the charter. We'll meet that deadline too.  
4       I even have a stretch goal on that, but I'm not  
5       going to tell you what it is.

6               MR. NEBBIA: Certainly, in the PPSG, one  
7       of the challenges we always had was as the  
8       discussions get more detailed, those senior people  
9       from all those agencies no longer feel interested  
10      in attending. Just back with the regular folks  
11      like us.

12             MR. DOMBROWSKY: I was about to say,  
13      I've never thought of you as a regular folk, but  
14      that might not come out the right way, so I won't  
15      say that.

16             MR. NEBBIA: And the other thing I  
17      wanted to mention is --

18             MR. DOMBROWSKY: So, we do understand  
19      there is an issue with how senior folks want to --  
20      but decide we need to -- or the White House  
21      decided and we certainly agree, we needed an  
22      advisory forum of senior people, given the import

1 of some of the issues that are now being tackled.  
2 And we think that the Interagency Council will be  
3 a valuable resource.

4 MR. NEBBIA: The other thing I wanted to  
5 note is I certainly understand the stress on time  
6 when it comes to identifying bands and making  
7 decisions off that. Certainly, we found as we've  
8 been now talking about the CBRS band, that band  
9 was identified during the fast-track report under  
10 the Obama administration where we were essentially  
11 given three months to come up with a band and put  
12 it on the table. And of course, when you're given  
13 that timeframe, you often have to rule out lots of  
14 stuff because the agencies just can't respond with  
15 a decision process to change systems that they've  
16 taken 20 years to build and implement. So, time  
17 isn't always the most important factor.

18 MR. DOMBROWSKY: So, in the national  
19 spectrum strategy, you'll note that the time for  
20 studies is a two-year period, right? And so, we  
21 think that is sufficient to be able to engage in  
22 serious studies and come up with serious



1 conclusions. We didn't try to push it beyond that  
2 because we thought for some of these bands in  
3 particular, two years is the right time. Now,  
4 some of them we may be able to address more  
5 quickly. Each band is obviously very different  
6 from each of the others.

7 MS. MANNER: Karl, is that -- anything  
8 else? Okay, anyone else have questions for  
9 Charles or Scott?

10 All right. I think it's because we're  
11 nearing Christmas and the holidays, so just in  
12 closing, I want to thank again the working groups  
13 for their reports today. And of course, the DWP  
14 group as well for their earlier report as well.  
15 We don't forget about you.

16 I had that role last time, so I feel  
17 your pain. All of them, whether UVB, CBRS, 6G,  
18 and ECI, are critical to assist, as Assistant  
19 Secretary Davidson noted, in NTIA and its work.  
20 It's been an honor for both Charla and myself to  
21 be able to chair CSMAC during this important work  
22 cycle. I know I've learned so much from my

1 colleagues and I greatly appreciate the give and  
2 take that has occurred during the development of  
3 these important reports, the times we've all been  
4 on phone calls for days on end, I want to say, it  
5 feels. But very good discussions and the patience  
6 of the working group chairs.

7           There are so many people to thank, from  
8 Assistant Secretary Davidson to Scott Harris,  
9 Derek Khlopin, and Charles Cooper, and of  
10 course, our DFO, Antonio Richardson, who's been  
11 what I would term the heart and soul of CSMAC  
12 discussion, for keeping us on track to handling  
13 the various issues we face, including technical  
14 issues. And we've also -- we also have to thank  
15 our four liaisons, Nick LaSorte and Ed Drocella  
16 from NTIA, Kevin Holmes and Jessica Quinley from  
17 FCC.

18           And then finally, I would be remiss if I  
19 didn't thank my co-chair, Charla Rath. It's been  
20 my pleasure and honor to work with Charla this  
21 year as co-chair. And finally, before I turn the  
22 floor over to Charla for her remarks, I just want

1 to wish everyone a wonderful holiday season, a  
2 very happy new year, and say I'm really happy I'm  
3 not in Dubai anymore.

4 MS. RATH: Thank you, Jennifer. This is  
5 Charla Rath and I really don't have a lot to add  
6 to Jennifer's words. Just, you know, again, thank  
7 you to everybody sitting at the table, those of  
8 you who couldn't be here, everybody on the phone,  
9 and all the work that's gone into the four  
10 subcommittees. You know, the co-chairs have all  
11 been great. I'm not going to name names. We've  
12 heard everybody's name over and over again, so I  
13 don't think I need to do that.

14 You know, we obviously really appreciate  
15 the hard work and dedication. And we've actually  
16 talked about this a couple of times. These are  
17 really meaty questions this year. And again, I'm  
18 so impressed with the work that came out and the  
19 number of recommendations. And you know, we'll  
20 watch this space and see what happens.

21 I'd also like to thank, you know, NTIA,  
22 not just generally, but specifically the spectrum

1 leadership. And that includes Scott and Charles  
2 and Derek. We really appreciate all of the  
3 assistance you've given us in understanding what  
4 it is that you need from us. So, thank you.

5 Obviously, many, many thanks to the  
6 liaisons. And in a way, I want to thank all of  
7 you for that too, because in the past, we've  
8 sometimes not had quite the interaction with NTIA  
9 that we have needed. And it has been terrifically  
10 supportive to have good people, you know, there  
11 and in liaison.

12 The other thing I want to say is thank  
13 you to the FCC because it has been incredible to  
14 have you very engaged in this process again. And  
15 so we really do appreciate it. So -- and we've  
16 already said thank you to Antonio, our intrepid  
17 DFO, who not only has been our DFO, but I don't  
18 know if guys caught this. He was a liaison to two  
19 of the subcommittees. So just in case you were  
20 wondering what he does -- and I'm sure there's  
21 more that we don't even know about. And as  
22 everyone knows, Antonio always does his multiple

1 jobs effectively and efficiently and with an  
2 immense reserve of good humor. So, thank you.

3 Thanks to my co-chair. It's a pleasure  
4 to work with you. Always educational, and you  
5 know, also entertaining. So, thank you -- which is  
6 a perfect combination as far as I'm concerned.  
7 And finally, thank you to NTIA for allowing me the  
8 privilege to serve as CSMAC co-chair at this time  
9 with my co- chair Jennifer.

10 So on that note, I think Jennifer and I,  
11 we're adjourning not only this meeting but also  
12 this term of the Commerce Spectrum Management  
13 Advisory Committee, in case any of you have been  
14 wondering what CSMAC stands for. So, thanks.

15 (Whereupon, at 3:43 p.m., the  
16 PROCEEDINGS were adjourned.)

17 \* \* \* \* \*

18 I Charla Rath and Jennifer Manner do hereby certify this  
19 transcript as Co-Chairs of the Commerce Spectrum Management  
20 Advisory Committee.

21  
22



## 1 CERTIFICATE OF NOTARY PUBLIC

## 2 COMMONWEALTH OF VIRGINIA

3 I, Thomas Watson, notary public in and  
4 for the Commonwealth of Virginia, do hereby certify  
5 that the forgoing PROCEEDING was duly recorded and  
6 thereafter reduced to print under my direction;  
7 that the witnesses were sworn to tell the truth  
8 under penalty of perjury; that said transcript is a  
9 true record of the testimony given by witnesses;  
10 that I am neither counsel for, related to, nor  
11 employed by any of the parties to the action in  
12 which this proceeding was called; and, furthermore,  
13 that I am not a relative or employee of any  
14 attorney or counsel employed by the parties hereto,  
15 nor financially or otherwise interested in the  
16 outcome of this action.

17

18 (Signature and Seal on File)

19 Notary Public, in and for the Commonwealth of  
20 Virginia

21 My Commission Expires: September 30, 2025

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