

UNITED STATES OF AMERICA
DEPARTMENT OF COMMERCE

+ + + + +

COMMERCE SPECTRUM MANAGEMENT
ADVISORY COMMITTEE (CSMAC)

+ + + + +

MEETING

+ + + + +

TUESDAY, JANUARY 11, 2010

+ + + + +

The Advisory Committee met in Room
4830, Herbert C. Hoover Building, 1401
Constitution Avenue, N.W., Washington, D.C.,
at 9:00 a.m., Dale Hatfield and Bryan Tramont,
Co-Chairs, presiding.

PRESENT:

DALE N. HATFIELD, Independent Consultant and

Adjunct Professor, University of
Colorado

BRYAN TRAMONT, Managing Partner, Wilkinson
Barker Knauer, LLP

LARRY ADLER, Product Manager, Google Inc.,
(by teleconference)

MICHAEL C. CALABRESE, Vice President and

Director, Wireless Future Program, the
New American Foundation

MARTIN COOPER, Executive Chairman and Co-
Founder, ArrayComm, LLC
(by teleconference)

SUSAN CRAWFORD, J.D., University of Michigan
Law School

MARK E. CROSBY, President & Chief Executive
Officer, Enterprise Wireless Alliance
(by teleconference)

PRESENT: (Continued)

DAVID L. DONOVAN, President, MSTV, Inc.

GARY EPSTEIN

BRIAN FONTES, Chief Executive Officer,
National Emergency Number Association

HAROLD FURCHTGOTT-ROTH, President, Furchtgott-
Roth Enterprises

ROBERT M. GURSS, Director of Legal &
Government Affairs, Association of
Public-Safety Communications Officials

KEVIN C. KAHN, Senior Fellow, Director of the
Communications Technology Lab, Intel
Corporation (by teleconference)

MARK A. MCHENRY, President, Shared Spectrum
Company

DARRIN M. MYLET, Adaptrum Inc.
(by teleconference)

THE HONORABLE JANICE OBUCHOWSKI, Founder and
President, Freedom Technologies, Inc.

ROBERT PEPPER, Senior Managing Director,
Global Advanced Technology Policy,
Cisco Systems, Inc.

NEVILLE RAY, Senior Vice President,
Engineering and Operations, T-Mobile USA, Inc.
(by teleconference)

RICHARD REASER, JR., Head, Spectrum Management

Department, Raytheon Space & Airborne
Systems

GREGORY ROSSTON, Ph.D., Deputy Director,
Stanford Institute of Economic Policy
Research, Stanford University

R. GERARD SALEMME, Executive Vice President,
Strategy, Policy, and External Affairs,

Clearwire Corporation

JENNIFER WARREN, Vice President, Technology
Policy & Regulation, Lockheed Martin
Corporation

JULIE ZOLLER, Program Director, ITT Advanced
Engineering & Sciences Division

TABLE OF CONTENTS

AGENDA ITEM	PAGE
Welcome and Opening Remarks	
1. Dale Hatfield and Bryan Tramont, CSMAC, Co-Chairs	4
2. Larry Strickling, Assistant Secretary of Commerce for Communications and Information	7
Discussion of Draft Subcommittee Reports for Approval	
3. Michael Calabrese, Incentives Subcommittee	8
4. Gerry Salemme, Unlicensed Subcommittee (Continue)	63
Presentations: Status of Administration Spectrum Activities	
10. Status of Administration Spectrum Activities, Karl Nebbia, Associate Administrator, NTLA Office of Spectrum Management	97
5. Legislative Update, Phil Weiser, Senior Advisor for Technology and Innovation	111
Break	161
Facilitated Discussion: CSMAC	
Next Steps	
9. Larry Strickling, Assistant Secretary of Commerce for Communication and Information	172
11. Opportunity for Public Comment	203
12. Adjourn	216

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22

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

(9:09 a.m.)

CHAIR TRAMONT: If we could have everyone take a seat, we'll get ready to get started. Thank you.

CHAIR HATFIELD: Okay. I would like to welcome you all to today's meeting of the Commerce Spectrum Management Advisory Committee.

I have up here with me my co-chair as well, Bryan Tramont. Normally, we start out by going around the room and also polling the land line here to find out who all is out there, but also to sort of reintroduce ourselves.

So, I'll start here to my right with Bryan Tramont, and why don't we go around the room kind of clockwise.

CHAIR TRAMONT: Bryan Tramont, Wilkinson Barker.

MEMBER CALABRESE: Michael Calabrese, New American Foundation.

1 MEMBER BORTH: David Borth,
2 formerly of Motorola.

3 MEMBER CRAWFORD: Susan Crawford,
4 Princeton and University of Michigan Law
5 School.

6 MEMBER DONOVAN: David Donovan,
7 MSTV.

8 MEMBER FONTES: Brian Fontes,
9 National Emergency Number association.

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

12 MEMBER GURSS: Rob Gurss,
13 Association of Public Safety Communications
14 Officials.

15 MEMBER EPSTEIN: The nameless Gary
16 Epstein, Aspen Institute.

17 MEMBER McHENRY: Mark McHenry with
18 Shared Spectrum Company.

19 MEMBER KAHN: Kevin Kahn, Intel.

20 MEMBER OBUCHOWSKI: Janice
21 Obuchowski, FPI.

22 MEMBER ROSSTON: Greg Rosston,

1 Stanford.

2 MEMBER WARREN: Jennifer Warren,
3 Lockheed Martin.

4 MEMBER ZOLLER: Julie Zoller, ITT
5 Corporation.

6 MR. NEBBIA: Karl Nebbia, NTIA.

7 MR. STRICKLING: Larry Strickling,
8 NTIA.

9 (Audience introductions.)

10 CHAIR TRAMONT: And on the phone?

11 MR. CROSBY: Mark Crosby, EWA.

12 MR. ADLER: Larry Adler with
13 Google.

14 MR. MYLET: Darrin Mylet,
15 Adaptrum.

16 CHAIR TRAMONT: Thank you.

17 CHAIR HATFIELD: Any others on the
18 line?

19 MR. COOPER: Martin Cooper.

20 CHAIR HATFIELD: Good morning,
21 Marty.

22 MR. COOPER: Hi.

1 CHAIR HATFIELD: Anyone else?

2 MR. COOPER: Yes, there is
3 somebody else on the line.

4 CHAIR HATFIELD: I think we had
5 four, right? There was four?

6 CHAIR TRAMONT: Yes. Four.

7 CHAIR HATFIELD: Okay. Then, with
8 that, I guess I'll turn it over to Assistant
9 Secretary Strickling for any opening remarks.

10 Larry?

11 MR. STRICKLING: Yes, I'll be
12 brief.

13 Welcome, everyone. This is the
14 last meeting of the current iteration of the
15 Advisory Committee. We're going to talk at
16 the end of the meeting about our plans going
17 forward.

18 We are going to recharter, and
19 we'd like to talk to everyone about what we're
20 thinking about in terms of the mission of this
21 group in its -- I believe it will be its third
22 or fourth iteration as we recharter here after

1 this meeting, but more on that as we -- after
2 we get through this morning's reports.

3 But otherwise, thank you all for
4 coming, and thanks to you who have joined us
5 on the phone, and I'll turn it back to Dale
6 and Bryan to get us going.

7 CHAIR HATFIELD: Okay. Our first
8 order of business, of course, is to discuss
9 the two draft subcommittee reports that we
10 have for approval, and the first one is the --
11 Michael Calabrese, who's here on the
12 incentives of the subcommittee.

13 Mike?

14 MEMBER CALABRESE: Right here.

15 CHAIR HATFIELD: Oh. Right here.
16 The doctor says I have cataracts. I'm falling
17 apart.

18 MR. STRICKLING: It's a hard job
19 when they sit so close.

20 MEMBER CALABRESE: Dale, you're
21 amazingly productive for someone who's falling
22 apart. I can only hope to match you.

1 So, this is the Incentives
2 Subcommittee report, which seems to be with us
3 always, and it was also the subject of our
4 last meeting by teleconference on December
5 13th where we hashed through this quite a bit.
6 And, thanks to everyone, not only who
7 participated on that, but who offered, you
8 know, many more comments and changes
9 thereafter.

10 There's been quite a spirited
11 discussion of this report and its
12 recommendations so, you know, I think I'll
13 just review them quickly so that we remember
14 what they are exactly, and then, you know,
15 however the Co-Chairs wish to proceed as far
16 any additional changes or adoption.

17 So, the report has three
18 recommendations which are now summarized at
19 the very back. So, first, the report
20 recommends that NTIA and the FCC study the
21 implementation of a spectrum fee and solicit
22 input from both Federal and non-Federal users,

1 and then it talks about the -- you know, the
2 main purpose of the fee in terms of
3 internalizing opportunity cost, hopefully
4 promoting efficiency thereby.

5 And there was, you know, I think,
6 as everyone knows, some ongoing disagreement
7 about whether the report should recommend
8 study of implementation or simply recommend
9 further study as to the advisability of
10 implementing fees at all. So, I just would
11 flag that.

12 Otherwise, I believe the report
13 now has integrated, you know, kind of both the
14 pro side and the con side into a fairly
15 balanced discussion which -- among the things
16 that we beefed up here is discussion of the
17 experience in the UK and the very recent
18 policy statement from OffComm just last month
19 where they've, you know, updated their AIP
20 framework, and we talk a bit about, you know,
21 what appears to be lessons learned on that
22 side.

1 The second recommendation supports
2 revisions to OMB Circular A-11 which calls on
3 agencies to -- or requires agencies to
4 integrate spectrum resources, resources into
5 their capital planning and management process.

6 The existing section in A-11 is,
7 in addition to being vague, seems to focus
8 primarily on evaluation of the spectrum, you
9 know, rather than really offering kind of more
10 transparency and accountability with respect
11 to, you know, considering it in the
12 procurement process as a trade-off.

13 And so, what we've done is
14 actually offered -- suggested an actual -- the
15 language for an actual rewrite of that section
16 of Circular A-11 so that it becomes a
17 checklist that requires the consideration of
18 spectrum in the procurement process more
19 explicitly and in comparison to other options,
20 and requires explanation if the most spectrum-
21 efficient solution is not selected.

22 And then finally, the third

1 recommendation recommends that NTIA support
2 broadening the allowable purposes of the CSEA
3 Spectrum Relocation Fund and thereby creating
4 a Spectrum Innovation Fund that would
5 reimburse approved Federal spectrum users for
6 the up-front research, planning and possibly
7 other costs related to modernizing Federal
8 systems, not only from migration off a band,
9 which the current Relocation Fund is focused
10 on -- it was created for the two thousand --
11 only for the bands that were auctioned in the
12 2006 auctions.

13 But this would allow a much
14 broader range of Federal agencies to tap the
15 funds for costs associated not only with
16 migrating off bands, but also with improving
17 Federal spectrum efficiency and facilitating
18 more spectrum band-sharing.

19 And because right now, as the
20 Incentives Committee, you know, I think kind
21 of overall perspective was that there's
22 perhaps nothing but disincentive right now for

1 Federal users to share -- to either vacate or
2 share spectrum, because there's costs that can
3 deplete mission budgets, which would make
4 sense from anyone's perspective, whether they
5 be a Federal agency or a private company, and
6 there's also, even with sharing, risks
7 associated with doing that which we, you know,
8 aired.

9 And so, at a very minimum we need
10 to make, you know, make sure that the
11 resources are available to move forward, and
12 I think we really view that as a prerequisite
13 to make progress in this area and the NTIA's
14 ten-year plan, you know, pointed that out as
15 well, and I think we've added some -- some
16 width and specificity to the report's
17 recommendation.

18 CHAIR TRAMONT: Okay. Any
19 comments?

20 Kevin?

21 MEMBER KAHN: There was a goodly
22 amount of discussion about, I guess, what

1 amounted to Sentence 2 of Recommendation One.

2 CHAIR TRAMONT: Yes.

3 MEMBER KAHN: Correct, Frank?

4 MEMBER CALABRESE: Yes. Right.

5 MEMBER KAHN: And, you know, I
6 kept thinking about it and I guess I was left,
7 even now when I read it, as not sure what it
8 is saying, because it seems to me to be saying
9 one of two different things.

10 It could be a straight-up
11 assertion of truth, that is, whatever this fee
12 is, it will have this effect. Or, it could be
13 an assertion of intent, which is to say, since
14 the first sentence says we're going to study
15 the implementation, it would be more in the
16 spirit of, you know, the fees should be
17 designed, too, all right, a statement of a
18 requirement on the result of that study, and
19 I'm not sure which it is.

20 And I kind of got the feeling that
21 a lot of the objection was to the
22 interpretation one, namely that it is a

1 statement of fact that you could read any fee
2 will have this effect, which is probably
3 pretty clearly not true.

4 On the other hand, the statement
5 interpreted two, the version two, which is to
6 say, when one does the study, the resultant
7 fee needs to be designed to have this
8 property, I think is a pretty reasonable
9 statement.

10 I guess it would be interesting if
11 we could redesign that sentence very slightly
12 to clarify which of those intents --

13 MEMBER CALABRESE: And Intent 2
14 would say something like "the fee," instead of
15 "would," it would say, "The fee should be
16 designed to --

17 MEMBER KAHN: To. Yes.

18 MEMBER CALABRESE: -- have the
19 effect of" --

20 MEMBER KAHN: That would be --
21 those are the two interpretations I can take
22 with that sentence, and they are very

1 different.

2 MEMBER CALABRESE: Yes. And just
3 to put it in context -- I wish I had been
4 there. A third way, as we were going back and
5 forth --

6 CHAIR TRAMONT: I don't -- I think
7 the third way doesn't work.

8 (Laughter.)

9 MEMBER CALABRESE: That way doesn't
10 have legs. But, in any event, because I think
11 the debate became, you know, whether to take
12 it out entirely or leave it in as-is, and I --
13 personally, I think that would be a very good
14 clarifying change because there was quite a
15 bit of disagreement about whether fees would
16 be effective.

17 MEMBER KAHN: Right. And that's
18 why I just wanted the clarification, which is
19 -- and that accommodates the conversation we
20 had earlier today.

21 MEMBER DONOVAN: Yes, I think so
22 because I think it's drafted and, Kevin, I

1 agree with you. It's interpreted as a sort of
2 statement of fact.

3 I'm not quite sure if it's
4 accurate in the sense of that, well, a fee
5 would have the effect of providing an
6 incentive. It may or may not, depending on
7 what service you are and what the regulatory
8 rules around it.

9 For example, if I'm a service that
10 has been assigned to a particular license by
11 the FCC and that's what it is, assessing a
12 fee, at least on -- for the private entity we
13 can't change, by law. This would simply amount
14 to a tax.

15 Now, it raises another public
16 policy question: What do we have to see would
17 make that change? But I think the second
18 approach that Kevin took, I think actually
19 provides some clarification.

20 CHAIR TRAMONT: And I think I
21 disagree with the idea that if there's a
22 limited set of options available to the

1 licensee that apparently a fee doesn't achieve
2 public policy goals.

3 I'm not sure that we need to
4 resolve that in order to --

5 MEMBER DONOVAN: No.

6 CHAIR HATFIELD: But you could
7 shift to a nonspectrum --

8 MEMBER DONOVAN: Spectrum-based --

9 CHAIR HATFIELD: -- nonspectrum
10 based system, even under those conditions.

11 MEMBER DONOVAN: As a consumer,
12 correct. But if I'm a -- for example, if I'm
13 a public safety license and I hold spectrum,
14 and I provide -- I have a license subject to
15 the separate regulations, and I'm also
16 providing the service but the government
17 believes a highest and best use may be an
18 alternative use, imposing a fee at that level
19 simply amounts to a tax.

20 CHAIR HATFIELD: I'm still
21 unclear. If I'm a public safety and I have a
22 point-to-point microwave, can I substitute

1 fiber for the point-to-point microwave, Mike,
2 wouldn't that free up spectrum?

3 CHAIR TRAMONT: Well, I'm using 50
4 Mhz and it's licensed for this few, driving
5 down to 25.

6 CHAIR HATFIELD: But I don't think
7 you -- you don't need to go that far. I agree
8 with you. Julie?

9 MEMBER DONOVAN: That's not the
10 question.

11 MEMBER ZOLLER: Thanks. As far as
12 the recommendations go, I think that each of
13 the statements in them should be actionable.
14 And what happens with the second and third
15 statements, they're more outcome or desired
16 outcome-oriented and not everyone agrees that
17 those outcomes would occur.

18 So, I think that the statements
19 need to be actionable. For example, after the
20 first sentence we could tell the parties to
21 take into account the considerations
22 elaborated in Section 2 of the report, or we

1 could suggest that criteria be developed to
2 determine whether or not the fees had met
3 whatever intended result was mandated.

4 But I think we need to come up
5 with actionable statements. Thank you.

6 CHAIR TRAMONT: So what's -- okay,
7 Gary?

8 MEMBER EPSTEIN: I think this
9 discussion really gets at the heart of what
10 the argument was about. I was trying to -- I
11 read these wonderful emails back and forth,
12 and it was the most interesting aspect of the
13 report.

14 And I think they were all making
15 good -- very good points. And, when I thought
16 about them, I think, really what it comes down
17 to is the distinction between the theoretical
18 and folks that were in the field a little bit.

19 And the theoretical stuff really
20 works, I think. I'd sign up for it. And the
21 folks who were in the field said, "Ain't no
22 damned way you're going to implement this in

1 a way which makes any sense at all."

2 And so, I really do think changing
3 -- as Kevin said, changing maybe the "could,"
4 to a "should," because I think the real
5 problem here is not the theoretical or in the
6 field, it's basically designing a system which
7 really works, and that's, I think, going to be
8 a difficult thing, and it's not what this
9 report was about, but it might be something
10 for a subsequent CSMAC or somebody else to
11 look at.

12 I mean, utilizing the UK
13 experience, and really figuring out how to
14 make a spectrum fee really have some sort of
15 effect, I think would be a really worthy goal
16 and something to have happen. We haven't
17 gotten to that point in this report.

18 CHAIR TRAMONT: So let's break
19 this apart. So, Kevin's recommendation, I
20 believe -- well, asked for there to be
21 clarification and he offers us two options.

22 I think since --

1 MEMBER KAHN: And I should say, I
2 actually think Option 2 is not perfect.

3 CHAIR TRAMONT: Very good. And I
4 believe we have an agreement that that's okay.

5 Does anyone disagree that changing
6 the word "would," to "should be designed to"?
7 Does anyone disagree with that edit?

8 CHAIR HATFIELD: One could also
9 say "properly designed in principle," but
10 probably also --

11 CHAIR TRAMONT: I'm sorry, how do
12 you want --

13 CHAIR HATFIELD: Well, I was just
14 saying that one of the ways of doing --
15 saying, "in principle," the fee -- or
16 "properly designed."

17 CHAIR TRAMONT: Oh, the fee would
18 have that effect --

19 CHAIR HATFIELD: Yes.

20 MEMBER KAHN: That would be fine,
21 too.

22 CHAIR TRAMONT: I was going to

1 this -- Julie said this was next. If we can
2 get -- I was hoping to get -- they are linked,
3 but I was hoping to get this one resolved if
4 we could.

5 MEMBER DONOVAN: Could you read
6 the sentences as edited as well?

7 CHAIR TRAMONT: Okay. Properly
8 designed or what?

9 MEMBER DONOVAN: No, I'm just
10 throwing out smoke.

11 CHAIR TRAMONT: Okay. The fee
12 "should be designed to have the effect of
13 providing." Okay. So, if we have a consensus
14 there, then I want to move onto the Julie kind
15 of issues. Okay. And including Jennifer.

16 MR. NEBBIA: Could I ask you a
17 question first?

18 CHAIR TRAMONT: And Karl, too.
19 Okay. Jennifer, then Karl, is that the way
20 we're going to do it?

21 MR. NEBBIA: Could I ask a quick
22 question first, please?

1 I think it's -- once again, I
2 think one of the important things here is that
3 we understand what the recommendations are.
4 And unfortunately, after the hundredth email
5 I dropped off the email page.

6 But, anyway, my understanding of
7 the first statement is that you're
8 recommending that we, in the Commission, do a
9 study of the implementation of spectrum fees.

10 In other words, we are getting
11 beyond a study of the principle and concept of
12 spectrum fees, and that we're actually
13 studying the ability to implement practical
14 approaches, whatever they might be.

15 So, we're -- because I had
16 understood that the working group had not come
17 to a conclusion of strongly recommending
18 spectrum fees.

19 And so I can't read this, knowing
20 the debate -- I can't read this in terms of
21 there's agreement that spectrum fees should be
22 the outcome.

1 Instead, the direction has turned
2 to, instead of debating the concept, let's see
3 if we can actually study and come up with some
4 practical approaches to do that, which might
5 lend themselves to a better decision in the
6 end.

7 So, that's important for me to
8 understand, up front, in order to interpret
9 how the second sentence, what that means also
10 because, then, it seems like the second
11 sentence is saying that, in the consideration
12 of fee implementations, the goal should be
13 this, and that ultimately, after all that,
14 looking at the practical solutions, you still
15 might come out with the decision that this
16 just isn't practical. It's not doable.

17 But if you're going to look at
18 this implementation, it should be for this
19 purpose. So, that's my understanding.

20 CHAIR TRAMONT: I believe -- is it
21 fair to characterize the Committee's
22 deliberation -- well, maybe you should have

1 started. Go ahead. But I think different
2 people have different --

3 MEMBER CALABRESE: Yes, could be.
4 Although I believe that's a fair
5 interpretation because, although I think we
6 are concluding that they -would be beneficial,
7 we raise a whole series of -- specifically
8 raise a whole series of questions that are
9 unanswered about the detailed implementation
10 and we raise a number of concerns about
11 possible side effects of implementation and,
12 thus, studying the actual implementation --
13 there needs to be more, further study of the
14 actual implementation.

15 CHAIR TRAMONT: So I think some
16 people would agree with what Michael said.
17 Some people don't, and other people view that
18 since the Administration and the FCC have both
19 said that fees are something worthy of
20 consideration, that we recommend a detail,
21 say, of how implementation would work because
22 that's the policy into which -- the context

1 into which we proceed.

2 So, I think they are two different
3 -- different factual places -- or factual
4 predicates that inform the recommendation that
5 would just say "the implementation of these."

6 They are not all the same and
7 one's -- these are beneficial. One's not so
8 sure, and one is, there's a policy out there
9 that's the direction we're headed in, so it's
10 time to study implementation.

11 I don't know -- Bob, then Rick --

12 MEMBER CALABRESE: No, no, no.

13 Jennifer.

14 MEMBER WARREN: A lot of what I
15 wanted to say has been captured with the
16 various comments which is, I think we are not
17 talking about an absolute conclusion that
18 these in all instances are appropriate.

19 What we did agree to agree to is
20 that there could be a study of implementation
21 across all of the users of spectrum to see
22 where fees may be appropriate, and we listed

1 different factors to take into account, when
2 looking at whether appropriate for each
3 category of users.

4 That is where I believe we've --
5 to use ITU parlance, you know, "affected a
6 delicate compromise and a delicate balance,"
7 reflected here.

8 So, I think that's very important,
9 and I think Julie's point about focusing on
10 actions which is, you know, perhaps not as
11 controversial for Point 2 and Point 3, may
12 make it just more beneficial to streamline
13 each of these recommendations to say, "What is
14 it when you read into these things that are
15 the takeaways?"

16 Implementation study, revise OMB
17 Circular A-11 and the SIF, as opposed to
18 characterizing each recommendation with a
19 particular intent or objective, when that's
20 what the body of the text is really supposed
21 to be all about.

22 And that's where the context is.

1 That's where the work has been done, and this
2 should just be an easy summary of the actual
3 recommendation for NTIA, as opposed to, again,
4 trying to, you know, bring into three lines
5 the work that's been done in multiple pages.

6 So, thank you.

7 CHAIR TRAMONT: Okay. So, I'm
8 sorry, I think it's Bob and then Rick and then
9 Greg.

10 MEMBER GURSS: Well, I agree with
11 Jennifer and I think, you know, as I was
12 thinking through, you know, all the different
13 qualifications that were debated, it can't
14 possibly be summarized in one or two sentences
15 here, and we're very critical to a lot of
16 people at the table so that, you know, these
17 implementation -- this implementation study
18 has to take into consideration all of the
19 qualifications and limitations that are
20 discussed in the body of the report.

21 So, either you reference that, you
22 know, or you do as Jennifer said, and you put

1 the recommendation with the -- which is
2 referring to everything before, in fact, is a
3 qualification of the recommendation.

4 CHAIR TRAMONT: So, just for
5 context purposes, the sentences that are here
6 are drawn from the earlier text. If -- and I
7 think what Jennifer at one point had proposed
8 -- and there may be some place we go next --
9 is adding, you know, we could add a sentence
10 and discuss it or two that discusses these
11 other divergent factors that need to be
12 considered, which I think was also language
13 that was agreed to, which is a way to make
14 this more complete.

15 It was designed to be -- and since
16 we, I helped craft this, it was designed to be
17 as concise as it could be in the overall
18 recommendations, but -- Rick and then Greg.

19 MEMBER REASER: I just wanted to
20 say that I think that the study part is
21 actually the most important part of this
22 because, all too often, in my work in the

1 government, we implement a policy and no one
2 understands anything about implementing it.

3 And so, when it hits the field,
4 and people have to do it, it just, it turns
5 out totally different. So, I think you need
6 to figure out how you would actually do this,
7 and the study of how you would do it, because
8 you may find out if it's unworkable because
9 clever people, as I tried to point out in my
10 little diatribe, was that they will figure out
11 a way to do whatever they want, regardless of
12 what the policy is.

13 We tried to reduce head counts in
14 program offices, head counts went up. We
15 tried to reduce office space, office space
16 went up.

17 I mean, every time we came down to
18 policy in my business about this -- and this
19 went -- there will be a bunch of clever people
20 will figure out a way around it.

21 So, you have to figure out how you
22 do it upfront, otherwise it, the policy itself

1 will be undermined by very smart people who
2 are just trying to get their job done, and
3 that's who you need to talk to, and then sort
4 of figure out how you're going to incentivize
5 their behavior because what you're really
6 trying to do is change people's behavior, not
7 just implement some policy, you know,
8 wholesale, because that's just kind of what
9 happens.

10 And that's sort of the issue that
11 I had. And one last thing is, you know, to be
12 honest with you, when I did the original
13 studies on what we were going to do in GPS in
14 '98, the first recommendation from my
15 lieutenants was, "Why don't we just go buy our
16 spectrums and be done with all this?"

17 And if Federal agencies had the
18 option to do that, we would have -- we would
19 have called it quits, bought like five
20 gigahertz or something like that, and just
21 paid the lady and been done with it.

22 I mean, that's -- instead, we've

1 spent now almost, you know, 15 -- or actually
2 it's almost 20 years now just arguing about
3 this stuff because we're sort of shackled by
4 the way we regulate spectrum for Federal
5 agencies.

6 If we could just buy a license and
7 just pay a fee every year and not have to
8 worry about it, and have somebody enforce our
9 rights, and all that kind of stuff, we would
10 have done that.

11 And that was the recommendation by
12 young college graduates when they first looked
13 at this thing. "Why can't we just do it like
14 AT&T?"

15 CHAIR TRAMONT: So, if I can
16 summarize, you would like to say that the
17 Federal government should purchase spectrum
18 rights, because that was just --

19 MEMBER REASER: I'm just saying
20 that --

21 (Simultaneous speaking.)

22 CHAIR TRAMONT: Greg, you're up

1 next and then I think we can go -- Harold,
2 then Kevin, excuse me.

3 MEMBER ROSSTON: I'm sure everyone
4 wants to know where this spectrum lady is.

5 (Laughter.)

6 I think -- well, a lot of what
7 we're talking about, we've definitely had
8 disagreement on our own committee about
9 whether or not fees should be implemented and
10 how they might be effective.

11 But, I think that this is sort of
12 a recommendation that's going to almost go
13 without saying. The FCC and NTIA are probably
14 going to study it, anyway, but I think we
15 should push to make sure that it happens that,
16 you know, as strongly as I am in favor of
17 spectrum fees, I think you need to make sure
18 that it's done right.

19 This is something that we thought
20 about when we put in auctions was, how do you
21 put them in, you know, think about doing it in
22 advance because, once you start doing it, it's

1 very hard to change how it gets done, so you
2 want to do it right and you want to see who
3 gets affected by it, and have it work when you
4 first start, because it is hard to change once
5 these things are started.

6 So, I think it is important to
7 say, you know, gee, it's possible that we
8 could go into this and say, gee, it's not
9 going to work at all, and so we shouldn't do
10 it.

11 But, in order to make an informed
12 decision, studying this is really important.
13 And I think the "should" is actually a great
14 change on this because I think that's -- when
15 you're sort of thinking the implementation,
16 you want to have fees that should do this and
17 provide the incentive.

18 So, I do actually like that change
19 in there.

20 CHAIR TRAMONT: Commissioner?
21 Harold, can you pull a mic down there?

22 MEMBER FURCHTGOTT-ROTH: I think

1 we also need to keep in mind the purpose of
2 our Advisory Committee is to make
3 recommendations, and I think recommendations
4 that will help the Administration move in a
5 positive direction, and not simply restate
6 recommendations of actions that the
7 Administration is already going to take.

8 And the Administration has already
9 publicly said that it's going to study
10 spectrum fees. And so, I think where we can
11 be helpful is to provide some expert guidance
12 about how best to go about doing that.

13 I think if it's watered down to
14 "Let's just study spectrum fees," I think it
15 simply is advising the Administration to do
16 what they've already said they are going to
17 do. I'm not sure there's a lot of value in
18 that.

19 So, I think as much specificity as
20 we can provide is going to be helpful.
21 There's an enormous amount of detail in this.
22 I really want to give my utmost thanks and

1 compliments to Michael on having shepherded
2 this Subcommittee over the past few months.

3 It's been a very delicate task,
4 very strong opinions on all sides. Michael
5 has been a very fair leader and arbitrator
6 among conflicting viewpoints, and so I want to
7 thank you for that.

8 And I think that Kevin's suggested
9 language strengthens the document.

10 CHAIR TRAMONT: Dr. Kahn and then
11 Dr. Crawford.

12 MEMBER KAHN: I just want us to
13 stay on point to the question of -- I love
14 brevity, but I think -- and I think this is
15 sort of what Harold was --

16 You know, if you drop out the back
17 two sentences here, I don't think you say
18 anything. I mean, you know, there are some
19 conclusions like, "Don't study spectrum fees
20 as a way to raise money for the government."
21 That's not what it's about. It's about this.

22 So, I think, you know, this is

1 about as brief as I think you can be and still
2 capture the point which is, if you're going to
3 do spectrum fees, these are the constraints
4 that the Committee thinks they should need.

5 It's not about, you know, money-
6 raising. It's not about three or four other
7 things it might be, and it may not work.
8 Right? Which is why it's -- you know, it is
9 a study of can you implement something
10 practical as opposed to impractical.

11 So I'll just say, without -- I
12 mean, I'd love it to be as brief as possible,
13 but if you shrink it to the point where it
14 loses all of the directivity of the bulk of
15 the report, I think the recommendation gets a
16 little too nebulous to actually be anything
17 more than "do what you're already doing."

18 CHAIR TRAMONT: Susan.

19 MEMBER CRAWFORD: Just very
20 briefly, I wanted to associate myself with
21 Kevin's and Harold's and Greg's remarks. I
22 think we have a terrific report here that's

1 gone through a lot of hard work and is
2 worthwhile and the amendment suggested by
3 Kevin's a good one.

4 I think we're going this
5 direction. I also agree with Bryan, and so
6 the Committee has to add its expertise.

7 And merely having the conversation
8 about what it means to have the CFO of an
9 agency come in and say, "What are you using
10 that spectrum for?" is going to be very
11 useful. And let's, you know, have the
12 directionality in place.

13 I think we're going in the right
14 direction and I know there's been a religious
15 war over spectrum fees for a long time, and
16 it's time to get down to the details.

17 CHAIR TRAMONT: Julie.

18 MEMBER ZOLLER: Thank you. I have
19 no difficulty being specific on what should be
20 taken into account on any sort of study. For
21 example, the considerations that are in this
22 report.

1 But, in terms of focusing, then,
2 on providing an incentive to those who value
3 the spectrum most, when the outcomes, that we
4 agreed in the beginning, were promoting more
5 efficient use of spectrum, expanding
6 capability and so on and so forth, to just
7 hone in on that one thing as an objective for
8 fees strikes me as just too narrow in terms of
9 a purpose.

10 Thank you.

11 CHAIR TRAMONT: Janice.

12 MEMBER OBUCHOWSKI: I wanted to
13 comment that I don't have a problem with being
14 somewhat more specific, but I think if you're
15 going to be -- the problem you encounter when
16 you're more specific is, unless you
17 incorporate the entire study, you're going to
18 focus on a specific issue.

19 And this specific issue gets back
20 to the issue of government waste. One reason
21 I can be comfortable with this study is that
22 it is recommending study of commercial fees as

1 well.

2 I worked seven years at the FCC,
3 and while a lot of spectrum is used at maximum
4 efficiency, a lot of spectrum has been -- you
5 know, the reason the FCC's in the position it
6 is at this point, searching for spectrum, is
7 that oftentimes they would allocate new bands
8 or do new things rather than revisit existing
9 uses because it was just way too politically-
10 loaded.

11 So, there is waste all around. At
12 some degree. And, you know, it has obviously
13 frosted me from day one on this Committee
14 that, you know, we're a pretty balanced
15 committee and we're focusing on government
16 spectrum.

17 I witnessed -- I commented on this
18 last meeting, the FCC Summit on Spectrum.
19 There wasn't a single government user there.

20 So, naturally the whole
21 perspective emerges that, you know, FCC is
22 just, with one exception, I guess, the

1 broadcasters, just maxing out on efficiency,
2 which is obviously not true.

3 But that's, again, what happens,
4 you know, in this comment. It gets right back
5 to one specific, and it's a specific that
6 pertains to the government user.

7 I just won't buy into that if
8 those are the recommendations.

9 CHAIR TRAMONT: David.

10 MEMBER DONOVAN: My understanding
11 of this recommendation goes beyond just
12 government usage, right?

13 MEMBER OBUCHOWSKI: Well, it does,
14 but then it gets into -- but then, when it
15 goes into the subtext.

16 MEMBER DONOVAN: So if there's a -
17 - just by way of suggestion, if there are
18 views on all sides and it's very difficult to
19 incorporate or report, the full report in a
20 sentence, in going to Chairman Hatfield's
21 recommendation in the past, would it be -- it
22 just is a way of a suggestion -- before the

1 second sentence and at least some preparatory
2 language that says, "Where appropriate,
3 consistent with the public interest, a fee
4 should be designed to have the effect on it."

5 MEMBER KAHN: But the second
6 sentence doesn't say anything about government
7 user --

8 MEMBER DONOVAN: Right.

9 (Simultaneous speaking.)

10 MEMBER KAHN: I think the action
11 would seem to be that the third sentence says,
12 "Government agencies," and we can fix that by
13 saying "Government agencies or commercial
14 users."

15 MEMBER DONOVAN: Yes.

16 MEMBER KAHN: I mean, that struck
17 me more as an oversight than a -- I mean,
18 because that's fair, I mean, that, you know,
19 because the rest of it all talks about both.

20 MEMBER OBUCHOWSKI: Yes. That's
21 fair.

22 MEMBER KAHN: So, I think the only

1 error in some sense is the third sentence
2 doesn't -- since it says specifically
3 "Government agencies," it should say
4 "Government agencies or commercial users," to
5 give greater consideration, then it can cover
6 everybody.

7 CHAIR TRAMONT: Anyone object to
8 that?

9 MEMBER OBUCHOWSKI: I have one
10 other question. I guess if we're going to
11 wordsmith it -- "little, if at all." Having
12 been in this business 30 years, I've never
13 seen anyone who has little or no value to the
14 spectrum they're sitting on.

15 And Greg and I had quite a debate
16 about foreclosure value. Even if it's
17 foreclosure value, you have a great number of
18 cellular providers who are, you know, sitting
19 on a lot of spectrum that they've not begun to
20 build out, but both for future use and
21 foreclosure of competition, potentially, you
22 know, it's valuable. So there's just sort of

1 an awkward phrasing, a loaded phrasing.

2 CHAIR HATFIELD: I'm a little
3 confused. When we talk about NTIA and the FCC
4 folks, that sort of includes both sides.

5 MEMBER OBUCHOWSKI: Right.

6 CHAIR HATFIELD: And then, with
7 this last change, "or commercial users," but
8 doesn't that fix the issue?

9 Janice, am I missing --

10 MEMBER OBUCHOWSKI: Well, I think
11 it does fix the largest issue that has been
12 raised. I believe that the point here, the
13 fee should have the effect of providing
14 incentive to those who value their assigned
15 spectrum, or portions of it, little, if at
16 all.

17 I'm not sure if there's a better
18 choice of words that might solve this problem.

19 MEMBER KAHN: If you have a low
20 value of some portion of the --

21 (Simultaneous speaking.)

22 MEMBER DONOVAN: One of the

1 problems that you have is that the value on
2 any one particular spectrum is actually
3 controlled by the regulations surrounding it,
4 Greg, and so if you're an entity, and it's
5 clear now that this applies to commercial
6 entities, and my uses are limited by the
7 regulations around it, assessing a fee on me
8 for, whether it's public safety or whether
9 it's broadcast or whether it's a carrier, when
10 that particular entity lacks the ability to
11 change and open up for broader uses, and all
12 that is in the text. It's quite -- frankly,
13 it's quite well-done. This recommendation
14 seems to say that, well, we should design it
15 to go to highest and best use, even though,
16 really, the entity that would end up being --
17 would be paying a fee really has no control to
18 deregulate itself so it could go to highest
19 and best use.

20 And so, you're left with a tax.

21 It's easier.

22 CHAIR TRAMONT: Right. Although

1 we did -- yes.

2 (Simultaneous speaking.)

3 MEMBER DONOVAN: That's why what I
4 was wondering is that if you could put
5 language in, "Where appropriate and consistent
6 with the public interest," this should be --
7 and it seems to take in the -- both sides of
8 the discussion that was included in the
9 report.

10 CHAIR TRAMONT: All right. Mark
11 hasn't had a chance to speak yet, so let's let
12 him do that and then we need to, I think, wrap
13 this up and find some closure here.

14 MEMBER McHENRY: It seems like the
15 real conclusion is this is really tricky and
16 hard. We ought to say it's really tricky and
17 hard --

18 (Laughter.)

19 MEMBER McHENRY: We have a list of
20 twenty or thirty really good issues, we should
21 direct them. You'd better answer all twenty,
22 thirty of these issues, or your study's

1 worthless. Otherwise, they can do any study
2 they want and all of that will be wasted.

3 So, I think we ought to direct
4 them, and there's 20 things you need to look
5 at, and they're right in here, and you've
6 better go for it.

7 CHAIR TRAMONT: Okay. Yes. Go
8 ahead, Bob.

9 MEMBER GURSS: Well, I think, if
10 we're not going to pare it down, as Jennifer
11 suggested, I think it is useful to make a
12 reference in the recommendation, however
13 brief, to the concerns, you know, how do you
14 want to frame it, but some reference to the
15 considerations raised in the body of the
16 report about the potential problems --

17 MEMBER McHENRY: Otherwise,
18 they'll pick and choose what they want to
19 answer --

20 CHAIR TRAMONT: Okay. So, is
21 there one option -- if we were to do that, and
22 I think there's -- we need to figure out if

1 there's a consensus, too, that there is --
2 there are two sentences in the text that try
3 to summarize right now what these are, and
4 that text reason, I should have the page
5 number. Let me see if I can --

6 I'll read it and then we can show
7 it. Page 9 of the Incentives Draft is where
8 this is taken from, and it's the very last
9 full paragraph.

10 "At the same time, decisions
11 regarding the appropriateness of fees for
12 spectrum users must take into account a host
13 of sometimes divergent factors. These include
14 maximizing efficiency and flexibility,
15 avoiding harmful interference, enabling
16 specific capabilities, taking technical
17 characteristics, i.e. propagation into
18 account, sustaining essential government
19 services and meeting other policy objectives
20 and considering potential international
21 implications and government appropriation
22 processes."

1 That summarizes sort of the -- the
2 family or it attempts -- it didn't, the text
3 at least, attempt to summarize the family of
4 issues that are addressed.

5 If we wanted to be more expansive
6 and include that language, or include
7 something about the other concerns, I would
8 suggest that's the way to do it. If there is
9 a consensus among us that we want to be more
10 expansive in this -- in this discussion.

11 So, I guess, why don't we throw it
12 open to see if people would like to include
13 the more expansive language? I hear Bob, at
14 least, saying that that's a good idea. I
15 think Jennifer and others may agree, but I
16 just want to see where we are, if there are
17 people who do not want to do that.

18 MEMBER CALABRESE: The first
19 sentence may be sufficient to the extent that
20 it will send you the report but, see, you
21 know, what those divergent factors are --

22 MEMBER ZOLLER: This report

1 recommends --

2 MEMBER REASER: I'd like that.

3 One of the things I'm -- and it's interesting
4 -- I think the regulatory status needs to be
5 added to this list, and this is the thing --
6 when I went back and people started talking
7 about GPS, the whole reason why we had L5 band
8 at 24 megahertz was regulatory status.

9 It had nothing to do with anything. It
10 had to do with regulatory status. And,
11 unfortunately, that drives -- that also drives
12 a lot of things. And, you're right. You end
13 up putting -- you're getting put in Spectrum
14 prison if you want to go through -- so do
15 something in a non-safety band that's a
16 safety-related thing.

17 And so that was -- that was their
18 thing. And I told them, don't do it. I
19 fought them for five, six years about that and
20 said, "Why don't we just go change the
21 regulatory status of the band?"

22 Says, "No, no, no. We have to go

1 to a band that has its regulatory status
2 already. And that's not the same, and so do
3 you tax? If you put -- maintain a fee for
4 that, for going to that band, you know, what's
5 their alternative?

6 I mean, if it does become a tax,
7 so I would regulatory status to that list --
8 but the idea, if we incorporate it in a
9 sentence, I think is a good one, that it does
10 capture all of them except for the one that
11 Dave's brought up about --

12 CHAIR TRAMONT: Jennifer, --
13 Janice, are you up or are you --

14 MEMBER OBUCHOWSKI: I think that
15 solves my problem, including perhaps -- you
16 have a second one that covers international.
17 I don't know if that's embraced in the first
18 sentence you have there, but to me that has to
19 be a factor that is contended with.

20 MEMBER WARREN: Bryan, I think
21 you're kind of giving us a light at the end of
22 this really long tunnel.

1 CHAIR TRAMONT: It might be a
2 train.

3 MEMBER WARREN: Oh, no. The glass
4 is half-full. But, if we can do that, I think
5 that is a way at least to balance this so that
6 if people who want the FCC and NTIA to have
7 direction, they can have a full sense of
8 direction, as opposed to just kind of halfway
9 there, and -- so I could support that as a way
10 forward. Thank you.

11 MR. NEBBIA: I think certainly
12 telling us what you're encouraging us to look
13 at is very helpful, and this linking it to
14 that, I think, solves some of the debate here
15 as to whether the second sentences are
16 clarification or direction or something, and
17 it puts it in, I think, a greater, you know,
18 context.

19 MEMBER MCHENRY: We have to go
20 through all these issues, right?

21 MR. NEBBIA: What's that?

22 MEMBER MCHENRY: We have to go

1 through every single issue in this report
2 think about. Is that what you get out of
3 this? Because if that's what you get out
4 this, we should put it in there.

5 MR. NEBBIA: Well, I think, in
6 fact, we have -- we've done significant study
7 here at NTIA on spectrum fees. The challenge
8 always gets to the implementation and whether
9 there are implementable schemes. That aspect,
10 I don't think we've studied in detail.

11 We've certainly done initial
12 responses to the theoretical studies, so I
13 think -- you know, I think it's helpful to
14 have what you see as the key elements.

15 CHAIR TRAMONT: Okay. All right.
16 So, if I'm correct, we have two changes to
17 this report as presented by Michael, so it's
18 presented to the group today.

19 One is that, in the second
20 sentence of Proposed Recommendation One, the
21 word "would" is changed to "the fee should be
22 designed to have the effect of providing."

1 That's change one. Five --
2 actually, there are three changes that, I
3 apologize. In the next sentence it could also
4 provide for incentives for future spectrum-
5 using programs planned by government agencies
6 and we're adding "or commercial users."

7 MEMBER CALABRESE: And --

8 CHAIR TRAMONT: Sure --

9 MEMBER CALABRESE: That sentence
10 for both.

11 CHAIR TRAMONT: And -- sure. "And
12 commercial users to give greater consideration
13 to efficient use."

14 And then the third change is the
15 addition of the two sentences on page nine of
16 the report that began, "At the same time,
17 decisions regarding the appropriateness of
18 fees for spectrum users must take into account
19 a host of other, sometimes divergent factors."

20 And, in the second sentence, which
21 runs through the appropriations processes. On
22 page nine, it's just lifted and added to the

1 recommendations.

2 MEMBER CALABRESE: One other thing
3 is to address potential change. It's to
4 address Janice -- we didn't move -- you know,
5 Janice is about the "little, if at all."

6 It actually may be more consistent
7 with the report to say -- we could say "below
8 its opportunity clause," if we want to be more
9 specific.

10 MR. NEBBIA: Aren't you
11 incentivizing everybody. You're providing the
12 incentive to everybody. I don't understand
13 the --

14 MEMBER CALABRESE: Who value their
15 assigned spectrum below its opportunity cost.
16 Or -- I'm just saying that could be -- there's
17 only the -- I'm just trying to wrap my brain
18 around what's an alternative to "little, if at
19 all," if that's bothering you.

20 CHAIR TRAMONT: So, when you say -
21 - it would say the fee should be designed to
22 have the effect of providing incentive for

1 those who value their assigned spectrum or
2 portions of it to reduce --

3 MR. NEBBIA: That doesn't make
4 sense.

5 (Simultaneous speaking.)

6 MEMBER CRAWFORD: You could take
7 out why you incentivize it and then say "to
8 reduce"? Just skip the language that's
9 irritating people. The fees should be
10 designed to have the effect of providing the
11 incentive for these actors, whoever they are,
12 to reduce --

13 MEMBER FURCHTGOTT-ROTH: Or even
14 more -- greater brevity would have the effect
15 of providing an incentive and then just go
16 straight to the end, to use, spectrum use, or
17 something.

18 (Simultaneous speaking.)

19 CHAIR TRAMONT: Okay. So, we can
20 -- can I read that, Bob, is that --

21 MR. PEPPER: No, no..

22 CHAIR TRAMONT: Okay. So the fee

1 should be designed to have the effect of
2 providing an incentive -- to use assigned
3 spectrum more efficiently. Or, to use spectrum
4 more efficiently. Okay. We're not going to
5 identify the actors. Okay. Thanks. Thank
6 you, everyone.

7 So, that is the summary of
8 Recommendation One. Those are the only edits
9 that we're adopting today to -- except Bob's
10 raising his hand.

11 MEMBER PEPPER: Just to the
12 question of "and commercial users." Are -- I
13 know that's a term of art as it relates to the
14 non-governmental users.

15 Do we not want to -- I mean, is it
16 -- do they all have to be commercial? There
17 are noncommercial --

18 (Simultaneous speaking.)

19 MEMBER ROSSTON: How about if we
20 just take out that portion again and just say
21 to -- to spectrum using programs to give
22 greater consideration?

1 CHAIR TRAMONT: Okay. So instruct
2 plan for government agencies. It just says
3 "incentives for future spectrum using programs
4 to give greater consideration to efficient
5 use."

6 MEMBER WARREN: I'm afraid that
7 the term programs automatically denotes
8 government as, I mean, most commercial users
9 talk about --

10 CHAIR TRAMONT: Systems. Systems.

11 (Simultaneous speaking.)

12 CHAIR TRAMONT: For future
13 spectrum users.

14 (Simultaneous speaking.)

15 CHAIR TRAMONT: To give greater
16 efficient use of the -- okay. All right.

17 Are we now -- are we now -- do you
18 need to have it read back or are we okay?

19 MEMBER ROSSTON: You said to use
20 their assigned spectrum -- did you take out
21 the word "assigned" in that -- use their
22 spectrum more efficiently?

1 CHAIR TRAMONT: It could also
2 provide incentives for future spectrum users -
3 -

4 MEMBER ROSSTON: No, no, the part
5 -- the prior end.

6 CHAIR TRAMONT: The prior end.

7 MEMBER WARREN: The fee should be
8 designed to have the effect of providing an
9 incentive?

10 CHAIR TRAMONT: Right.

11 MEMBER WARREN: What do you have
12 next?

13 CHAIR TRAMONT: To use their
14 spectrum more efficiently.

15 CHAIR HATFIELD: Do we need to
16 have it read back one more time or are we --

17 (Simultaneous speaking.)

18 CHAIR HATFIELD: This is sort of
19 our last meeting. There's limited ability to
20 do so and I was sort of wanting to make sure
21 that we don't reopen it --

22 CHAIR TRAMONT: All right. One

1 more time. All right. "Fees to be designed
2 to have the effect of providing an incentive
3 to use spectrum more efficiently. It could
4 also provide incentives for future spectrum
5 users to give greater consideration to
6 efficient use in choice of tonality, systems
7 and services." And then, the two sentences
8 from page nine.

9 Okay? All right. All those in
10 favor of adopting the report, as amended,
11 signify by saying aye.

12 (Chorus of Ayes.)

13 CHAIR TRAMONT: Folks on the
14 phone, anyone? Anyone opposed?

15 (No response.)

16 CHAIR TRAMONT: Excellent. First
17 report is adopted. Congratulations.

18 (Simultaneous speaking.)

19 MR. NEBBIA: Could I just ask a
20 question, once again, so we understand on our
21 side. We've debated the first recommendation
22 in depth, and I just want a little

1 clarification on the third recommendation
2 because, in principle, the greatest concern
3 over this spectrum relocation fund versus
4 spectrum innovation fund is the concern that
5 you create a fund that's out there for people
6 to play with and I'm just trying to understand
7 how -- you know, once again, this becomes, in
8 some people's mind, a tool for people
9 appropriating themselves money through this
10 process, coming up with new ways to study
11 things that may have no chance whatsoever and
12 burning off the money.

13 And so, was there any -- was there
14 any discussion along -- along those lines
15 about appropriations issues --

16 MEMBER CALABRESE: Right.

17 MR. NEBBIA: -- and how this gets
18 controlled?

19 MEMBER CALABRESE: Yes. We
20 addressed that. I mean, we discussed that,
21 actually, quite a bit and I believe we
22 addressed -- we thought we addressed it fairly

1 specifically in here. For example, we
2 recommended NTIA, that these be, you know,
3 merit-based applications reviewed by NTIA, or
4 approved -- recommended by NTIA and then
5 approved by OMB if they're above a certain
6 amount, that they not be an end run around
7 appropriations.

8 We talked about gold plate, you
9 know, you should avoid any sort of gold-
10 plating, that they should be marginal cost-
11 based, and so on.

12 So, you know, I think it's -- you
13 know, I think those concerns were addressed.

14 CHAIR TRAMONT: Okay. Anything
15 else on the Rec One?

16 (No response.)

17 CHAIR TRAMONT: Excellent.

18 Mr. Salemme, you're up.

19 (Simultaneous speaking.)

20 MEMBER SALEMME: Thank you.

21 Hopefully, we won't be as contentious as the
22 last one because I don't think we were as

1 aggressive in trying to stake out new
2 territory.

3 Many of the members of the
4 Subcommittee, many of whom had participated in
5 the TV white space proceeding at the FCC, I
6 think, were reluctant to rehash unlicensed as
7 it had just unfolded before the FCC proceeding
8 and, instead, wanted to take more of a
9 forward-looking approach to this report and
10 try to view unlicensed as it could be seen in
11 the future as technological advances came to
12 the fore that allowed more activities in
13 unlicensed and less dependence on license
14 spectrum specific allocations and assignments,
15 many of whom were then tied to regulation
16 specific to the activity that was assigned
17 under that license.

18 And, under the leadership of Marty
19 Cooper, the visionary of us all in cellular,
20 we I think tried to look at this to say, how
21 do we take the technology that we see in front
22 of us and look at unlicensed and say, does it

1 permit us, if government policies directed
2 appropriately to take a new approach that is
3 less dependent on license spectrum use and
4 actually facilitates more unlicensed spectrum?

5 And the first drafts of the report
6 drew some criticism, especially from some who
7 thought that the forward-looking approach
8 really didn't give you enough specifics to
9 view unlicensed and also that there was a --
10 I think, a concern that it was more just of a
11 rehashing of technology in sharing the
12 unlicensed.

13 But the idea of the report -- and
14 I'm going to give Marty a few minutes to kind
15 of capture this -- was to really say, let's
16 look at the technologies on the horizon.
17 Let's look at unlicensed through the prism of
18 what these new technologies can bring. What
19 does sharing actually permit us to do with
20 unlicensed and then let's today begin
21 government policies that will actually
22 facilitate these technologies and, at the same

1 time, promote a regime that is less dependent
2 on license spectrum with all of the baggage
3 and burdens that are incumbent of licenses,
4 and see if we can have and facilitate more
5 unlicensed use, and whether or not we can use
6 unlicensed spectrum or uses of spectrum to
7 actually promote these technologies and move
8 them forward more quickly.

9 With that, Marty, do you want to
10 add anything to that?

11 MEMBER COOPER: (Inaudible.)

12 MEMBER SALEMME: Was that a no?
13 We couldn't hear you, Marty.

14 CHAIR TRAMONT: Speak up, Marty.

15 MEMBER COOPER: I think that Gerry
16 described it very well.

17 MEMBER SALEMME: Great. And Marty
18 was doing that from an unlicensed device. Let
19 that be noted for the record.

20 So, that's where we were. So, the
21 recommendations really, I think, you know, to
22 deal with -- I know many of the concerns that

1 Karl raised, and this is, like any report of
2 this committee, is not without controversy,
3 and definitely does have its -- a direction in
4 a bias towards unlicensed and actually would
5 recommend that specific spectrum be allocated
6 exclusively for unlicensed use, unlike the
7 current regime where you could always have
8 some use of -- of non-interfering use of
9 unlicensed as Karl has pointed out the
10 spectrum.

11 The Committee believed that it was
12 best to move forward and promote this type of
13 a regime, but there's been an effort to
14 really, I think, to take into the
15 considerations that were brought forward by
16 Janice and many other members of the Committee
17 that thought that it really did not have
18 enough specifics and meat to tie to unlicensed
19 around enforcement and other areas.

20 CHAIR TRAMONT: I do have an edit
21 which is to something that I'm clarifying and
22 it hopefully should not be controversial on

1 page eight.

2 I had added language that said
3 "Gaps in the database created by Federal
4 users" -- this is in the first full paragraph
5 on page eight.

6 This is discussing the experience
7 of five gigahertz unlicensed, and I'd offer
8 this, "Gaps in the database created by Federal
9 users" clause -- the second to the last clause
10 in the last sentence.

11 That's really not an accurate --
12 or not a detailed enough characterization of
13 what happened, so I would, instead, offer a
14 footnote, and I'll give this to Gerry.

15 It says, "Government and industry
16 have also discussed a new certification test
17 that reflects TDWR missions characteristics in
18 ways that the initial certification test did
19 not."

20 But, there is an issue around the
21 testing protocol at five gig, and I sloppily
22 characterized it as "gaps in the database."

1 It should be more -- just a bit more clearly
2 states what's actually happening and more
3 accurately states, I think, the nature of the
4 FCC report.

5 So, I think it's important to
6 identify that there was a gap in how the
7 original testing was done, but I don't think
8 that the gap as described in the text was
9 accurate. So, I propose this more detailed
10 amendment if I can, as a footnote. So, that
11 was my only thing.

12 Bob, and then Greg.

13 MEMBER PEPPER: Thank you for
14 getting that because I was going to reference
15 the -- go back to the question of the after
16 the FCC report, and I think this takes care of
17 the issue because, in the first paragraph
18 under the DFS discussion on page seven, it
19 talks about the -- I guess it's the -- I'm
20 trying to look at different -- different
21 versions.

22 The certification -- it talks

1 about the need to ensure adequate
2 certification and enforcement mechanisms.
3 It's not just that. It's also the adequate
4 design of requirements of testing and
5 certification, because the problem was not the
6 certification as much as it was that there
7 were -- there was equipment that was following
8 the rules.

9 The problem was the way the rules
10 were written. It turns out they were
11 inadequate because there was not sufficient
12 testing, and I think it's -- it's more
13 complicated than just certification and
14 enforcement.

15 So, I'm just wondering whether
16 that needs to be modified in the text as an
17 addition to the footnote.

18 CHAIR TRAMONT: So how would that
19 look, Bob?

20 MEMBER PEPPER: To ensure adequate
21 design, testing, certification and
22 enforcement. I'm trying to figure out between

1 -- I'm working with different versions.

2 CHAIR TRAMONT: I'm sorry. Which
3 page are you on? I apologize.

4 MEMBER PEPPER: Seven. Page one
5 to seven.

6 CHAIR TRAMONT: Oh. I see.

7 MEMBER PEPPER: Yes. Gerry, does
8 that make sense?

9 MEMBER SALEMME: That's fine. I
10 think that is a helpful --

11 MEMBER PEPPER: Okay. If we get
12 that right, there's going to be less need to
13 pull back, right?

14 CHAIR TRAMONT: Right.

15 MEMBER PEPPER: Okay. Good.

16 CHAIR TRAMONT: Greg and then
17 Janice and then Harold and Kevin.

18 MEMBER ROSSTON: So I have sort of
19 a different type of thought than, I guess, the
20 last two people who had very -- you know,
21 things -- I had a trouble with the overall
22 theme of this which was, we need to promote

1 unlicensed is how I read this.

2 And, it's a -- sort of an
3 assumption that unlicensed is good is
4 throughout this. There are parts where it
5 sort of balances, but at the very start it
6 says we think we should promote unlicensed as
7 a Committee and, to me, the goal is not let's
8 promote unlicensed or let's promote license,
9 but let's promote spectrum efficiency.

10 And the tone of this is not
11 written as what the goal should be, and so I
12 had a real -- real trouble reading through
13 this when there were lots of things that sort
14 of said, "Gee, we think unlicensed is good,"
15 and it's sort of going through this whole long
16 debate that's been going on for years, and
17 sort of coming to a conclusion that, in a lot
18 of ways I'm not convinced about.

19 And so I was -- I was very, very
20 troubled by sort of the overall tone and the
21 recommendations as sort of taking as given
22 that unlicensed is better than licensed, in a

1 lot of cases and it should have -- in my mind,
2 if you're going to make the case for
3 unlicensed there are conditions under which it
4 may be reasonable to have unlicensed spectrum,
5 but we should talk about what those conditions
6 are and when it's appropriate to have
7 unlicensed spectrum, as opposed to just sort
8 of making a blanket recommendation because you
9 make more spectrum available for unlicensed.

10 It may be the case that unlicensed
11 spectrum is very good when you have a spectrum
12 that doesn't travel very far, so there's not
13 a lot of contention between users or something
14 like that that, but we should try and think
15 about the conditions under which unlicensed is
16 good, as opposed to trying to just sort of
17 make a generic recommendation of "Let's put
18 our unlicensed spectrum," and that was -- that
19 was the concern that I had in reading through
20 this.

21 MEMBER SALEMME: I don't think --
22 that is not what the attempt -- and I don't

1 think that was the Subcommittee's position.

2 I think the Subcommittee believes
3 in it's thoughts from a predicate, that most
4 of the spectrum and most of the efficient use
5 is from licensed.

6 So, this was saying that there is
7 a place for unlicensed and I think it was
8 trying to promote that and find an appropriate
9 basis for which that to take place.

10 I don't think this report -- and
11 I'm sorry if the tone was written in that
12 fashion that you read it, that it was
13 promoting unlicensed to the detriment and to
14 say that licensed was no longer necessary.

15 And again, it was forward-looking.
16 Right now it would say, and I think it tried
17 to capture all the caveats that the Committee
18 members had, that licensed is primarily the
19 use of spectrum, and that's efficient and
20 that's appropriate, but it does look forward
21 to say in a new world, in a new technology, if
22 there is a role for unlicensed let's put it in

1 place now.

2 So, I would be in favor of
3 changing, you know, removing any of the
4 tonality comments that -- that go too far,
5 because that is not the Subcommittee's
6 position.

7 MEMBER DONOVAN: Would a solution
8 just be to put maybe a small paragraph in the
9 overview, preparatory just sort of laying out,
10 Greg?.

11 MEMBER ROSSTON: I found lots of
12 things throughout. For example, the challenge
13 to improve spectrum efficiency can only be
14 achieved by first developing technologies and
15 competitive use of unlicensed spectrum.

16 That sort of sounds to me like
17 it's promoting unlicensed and when the thing's
18 due out, I think what we would want to do is
19 come up with a framework that says here is
20 where the kinds of things that make unlicensed
21 valuable and there is where we should be
22 promoting unlicensed use.

1 So that was -- you know, I think -
2 - I think it doesn't have the framework of
3 where unlicensed is, it's sort of a
4 scattershot of unlicensed is good throughout,
5 and that was my concern.

6 I think there are -- I think there
7 is a way to take this and sort of say, let's
8 try and figure out where unlicensed can be
9 valuable and then put it in, or put in a
10 framework that makes sense, as opposed to
11 right now it's sort of a scattered kind of --
12 it doesn't tell me when unlicensed would be
13 good or not good or when unlicensed would be -
14 - when licensed would be good or not, and what
15 kind of things it can be valuable for.

16 This just says unlicensed can get
17 rid of entry error and unlicensed can promote
18 spectrum efficiency and I'd like to know when
19 that is and what our recommendations would be
20 for in a more specific way to move forward
21 rather than -- to me, this -- and sometimes
22 moving the debate back to just arguing over it

1 as opposed to saying let's put a framework
2 that says where people should look, so Paul
3 can actually look at specific types of bands
4 and that sort of thing that might be useful
5 for the unlicensed or sharing.

6 MEMBER COOPER: And I think that
7 maybe we didn't express it well. There are
8 proposals now to -- besides for the Section 4
9 , that the suggestion is reportedly, that when
10 the technology becomes available make
11 unlicensed spectrum work as it can be
12 extraordinarily useful.

13 And I don't think there's anything
14 in there that says that everything should be
15 unlicensed. But what is left in the report
16 does say is that there are some extraordinary
17 gains that could be made if you have the right
18 technology in sharing, and that once you
19 achieve that level of improvement, partial
20 efficiency -- and with kind of sharing -- is
21 that there may not be any reason to have
22 licensed spectrums.

1 So, I think everything the report
2 shows that there is a legacy, both licensed
3 and unlicensed spectrum and that we shouldn't
4 hasten to assign a license, especially before
5 we really understand that technology can do.

6 That's is what tried to express.
7 I don't know how you would extract from that
8 that we were proposing that unlicensed
9 spectrum use is good. What we did say is
10 sharing is good, and the reason beginning part
11 is where we talk about what the ultimate
12 objective is in sharing.

13 It was sharing that we were
14 proposing, not unlicensed.

15 CHAIR HATFIELD: There are still
16 some hands up. I'll go ahead and jump in, but
17 I think we can't reopen this in this
18 fundamental way at this point. We just simply
19 do not have time.

20 And what I'm doing is trying to
21 search for some way that we might capture
22 Greg's concerns, which I think are very well-

1 taken.

2 But, is there some sentence or
3 something that we could add at the end that,
4 you know, some members of the Committee --
5 something felt this way, and there's -- do
6 something to move on because, I mean,
7 candidly, we're -- we just don't have time to
8 reopen this, I think, in as fundamental way as
9 you're suggesting it.

10 CHAIR TRAMONT: And some of the
11 details about that, you know, they would be
12 helpful to recommend to the -- bands or things
13 -- factors that would go into considering it -
14 - maybe that's what the next, you know, the
15 next CSMAC can tackle in our next charter for
16 work, but I think at this point we want to try
17 and, if we can, wrap this one up since we've -
18 - this is our final meeting and our second
19 presentation of this draft.

20 I mean, the draft has evolved away
21 from something that was more aggressive on
22 unlicensed I think, and maybe we didn't get

1 all the way there, but if there are edits that
2 would be helpful. I know we set some tents
3 up, too.

4 MEMBER ROSSTON: Marty was trying
5 to say something and I couldn't --

6 CHAIR TRAMONT: Oh, sure.

7 MEMBER ROSSTON: Marty, were you
8 trying to talk?

9 MEMBER COOPER: Yes, I just lost
10 the conversation for a while, but I'm going to
11 do that because --

12 CHAIR TRAMONT: We're going to
13 try and go around.

14 MEMBER PEPPER: To Dale's point,
15 just even in the introductory second sentence.
16 Instead of "increase use of unlicensed
17 spectrum bands enhances, can enhance the
18 public interest." Again, it's beginning --

19 MEMBER COOPER: Tell me where
20 you're looking.

21 MEMBER PEPPER: Marty, the first
22 paragraph, the second sentence.

1 CHAIR TRAMONT: See, that's
2 interesting. I read that sentence to be
3 increased efficiency in unlicensed spectrum
4 bands, so I read the use as not additional
5 spectrum allocations. I read it as more use
6 of existing bands.

7 So, if you --

8 MEMBER SALEMME: That's what it
9 was meant to say.

10 MEMBER PEPPER: If that's what it
11 was meant to say, then you need to change
12 that. I mean, that was -- you clarified it --

13 CHAIR TRAMONT: Increased
14 efficiency in unlicensed bands, enhances the
15 public interest.

16 MEMBER PEPPER: Yes, just to be
17 explicit about what that is, sort of the
18 "if/and."

19 CHAIR TRAMONT: Yes.

20 MEMBER CALABRESE: I think it's a
21 good example, and even the one that Greg
22 raised, where it's not -- there's nothing in

1 here that's -- the Committee -- the
2 Subcommittee did not take on at all the
3 question of whether or not unlicensed, or much
4 more unlicensed or not.

5 It was about enhancing unlicensed
6 so we just assumed the existence of -- of the
7 unlicensed bands and it just simply wasn't on
8 the table whether we want to roll those back
9 or hugely expand them. We didn't address it.

10 MEMBER SALEMME: And that's why I
11 think to make that clear at the outset, that
12 that's what the report was trying to capture,
13 and that was the scope of the report may be
14 helpful, I think, to address Greg's issue
15 which is fine, because that really is what the
16 Subcommittee is doing.

17 CHAIR HATFIELD: Can you give us
18 more language here? I'm really focused on
19 trying to get this -- trying to get this done.

20 So, if you -- maybe in the next
21 minute, while we're taking some other comments
22 --

1 CHAIR TRAMONT: Well, take some
2 other comments, and then we and then we can do
3 some writing. Janice and then Kevin and then
4 Harold.

5 MEMBER OBUCHOWSKI: Well, to
6 Dale's point, I think in a way the text can be
7 amended. My biggest concern, and this kind of
8 bleeds over to the next discussion is that the
9 recommendations, to my mind, are harder to
10 fix.

11 I would not be prepared to
12 recommend an allocation of more unlicensed
13 unless some of the fundamental enforcement
14 questions, and sharing questions that
15 inevitably come up, are addressed in a more
16 fulsome way.

17 Now, you know, this report could
18 work very well for the discussion, and I
19 firmly believe this, since the value of
20 unlicensed, of new frontiers that might make
21 unlicensed more valuable and more possible,
22 about the fact that, you know, the US has led

1 the way in some ways with unlicensed and, you
2 know, had some -- experienced some of the
3 benefits.

4 But we're now at something of a
5 watershed, and I think we're all very well-
6 aware of some of the drawbacks or potential
7 drawbacks of unlicensed absence better
8 enforcement.

9 We've seen it. I mean, there's
10 sort of a rah-rah aspect to the discussion of
11 five gigahertz. Five gigahertz has been no
12 picnic. And I would not want to go down that
13 path again until we have solved for the
14 problems that arose there.

15 So, you know, I don't mind the
16 first half of the context that these are great
17 frontiers and these are developments that can
18 be helpful, but until we answer some of the
19 nuts and bolts questions, I wouldn't be
20 prepared to support a recommendation of
21 opening more unlicensed bands, nor am I
22 prepared to support a recommendation, which I

1 think sort of jumps out of nowhere or needing
2 a national spectrum technology road map.

3 That seems like a broader
4 recommendation than an unlicensed report would
5 warrant. I would welcome an opportunity to
6 discuss and on, you know, a road map to a more
7 mature approach to unlicensed. I mean,
8 there's a whole lot of dialogue that wouldn't
9 find its way into this report, and frankly,
10 doesn't even find its way to my mind -- of
11 course, I don't read everything -- into the
12 FCC discussions.

13 I mean, Europeans and other people
14 who think hard about unlicensed have asked us
15 repeatedly, you know, why don't you have
16 different kinds of unlicensed bands? Why
17 don't you in some way, you know, mandate
18 sharing of like technologies or be more
19 specific up-front about your obsolescence
20 characteristics.

21 And we've never really wanted to
22 go down that path. We're all in the sort of

1 "y'all come" mode when it comes to unlicensed.

2 I think that's part of a road map
3 I'd like to discuss going forward, but that's
4 not what's here. What's here is a very broad-
5 based recommendation of a technology road map,
6 and I frankly think, coming on the heels of
7 the National Broadband Plan and a lot of the
8 work here, this is -- this isn't a
9 recommendation I'd want to make at this point.

10 So, I don't mind the first half of
11 this, if properly caveated, but I think the
12 second half jumps to some recommendations that
13 are rather large.

14 MEMBER COOPER: Well, I agree with
15 you that's a large recommendation, but I also
16 think --

17 CHAIR TRAMONT: I'm sorry, Marty.
18 Marty, we're having a little bit of trouble
19 hearing you, so could you restate what you
20 just said?

21 MEMBER COOPER: I'll talk a little
22 louder. Is that better?

1 CHAIR TRAMONT: Yes. Better.

2 Thank you.

3 MEMBER COOPER: I think that the -
4 - that road map recommendation is the most
5 important part of the reporting, and let me
6 tell you, with the genesis of that is.

7 We start talking about the
8 appropriateness of unlicensed spectrum, and
9 the discussion always focuses on the
10 technology, and there is no technology today
11 that really does unlicensed spectrum very
12 well.

13 And when we start talking of what
14 the possibilities are and we put that under a
15 broad umbrella of dynamics, spectrum access,
16 which I think includes everything -- anything
17 anybody could think of that makes a hugely
18 spectrum better, and we have all kinds of
19 discussions about when that's going to happen.

20 And if Michael Calabrese thinks
21 that that's going to be next year -- I'm
22 exaggerating, Michael, so forgive me for that.

1 And I think it's going to take 30 years, and
2 none of those discussions have any meaning
3 unless somebody objectively analyzes this and
4 uses whatever ability we've got to predict
5 what this future will be.

6 But, meanwhile, the policymakers
7 are being asked to make decisions that are
8 based upon technology judgments and they don't
9 have the right judgments.

10 MEMBER OBUCHOWSKI: Well, you
11 know, Marty, I'm sorry to jump in again. I
12 absolutely agree with that which you said, but
13 that is a more specific --

14 MEMBER COOPER: I'm sorry. I
15 can't hear you.

16 MEMBER OBUCHOWSKI: I'm sorry,
17 Marty. I just wanted to say I absolutely
18 agree with what you said, but that is not what
19 the recommendation says. It's broader than
20 that.

21 I mean, yes, I think it's
22 critically important. Everybody's throwing a

1 lot of expectation on DSA and, you know, it
2 could lead to the utopia, or the utopia could
3 be present, but after we're all dead.

4 And it would be very prudent to
5 have a sound discussion of DSA, where it's
6 heading, what it's going to cost. You know,
7 a lot of these consumer -- a lot of these
8 unlicensed products are low-cost consumer
9 products.

10 So, how much of the cost of
11 DSA is realistically going to be built into
12 some of this stuff, or is that going to be --
13 or should that be in a separate band? Should
14 there be a junk band, where none of these
15 technologies apply. The law of the jungle,
16 which is what 900 megahertz has been.

17 You know, I don't know, but that's
18 the road map that I think would be very
19 legitimate to discuss, but that's not fleshed
20 out in this recommendation.

21 CHAIR TRAMONT: Let's try and get
22 through the folks who had their hands up.

1 Kevin and then Harold.

2 MEMBER KAHN: I actually had a
3 really mundane detail point, but it does --
4 maybe it provides a little bit of underpinning
5 for what some of what Janice just said in
6 terms of obsolescence.

7 I was a little bit surprised. You
8 know, there's a lot of discussion here about
9 forward -- forward legacy, if you will. You
10 know, if we do something today, how do we
11 control it?

12 Just the observation that almost
13 every one of these devices is, in fact,
14 attached to the internet, and it might be
15 actually worth stating that there are options
16 were we certify equipment that says, it must
17 call home once a year.

18 I mean, I'm not talking about, you
19 know, every microsecond, this is not the DSA
20 solution, but certainly you could get away
21 with requiring equipment to check in on some
22 interval and that would give you a handle on

1 things like, gee, we want to take equipment of
2 that vintage out of circulation with a four-
3 year horizon.

4 So, you tell everybody. I mean,
5 it's sort of a much more organized way of, you
6 know, the digital TV transition where you kind
7 of tell everybody, but now you basically have
8 this equipment that's been certified where,
9 you know, it's got a timer in it and it's got
10 our -- you know, get recertified, essentially,
11 on some interval, long-term interval. And
12 then it shuts itself down if that's -- if
13 that's appropriate.

14 It also might give you a handle,
15 if you ever want to do this -- and I hate to
16 jump into this water -- but on things like
17 spectrum fees, you know, you could certainly
18 say, you know, I mean, look, there's a lot in
19 consumer products today that essentially you
20 buy their use for a window in time, as a
21 consumer.

22 This is an understood concept, and

1 so if you wanted to create a situation where
2 you said, "Okay, we're willing to set up the
3 band, but you know, a user of that band has to
4 pay ten bucks a year, you know, for the
5 equipment that runs in that band."

6 You would have a mechanism to do
7 that. So, I mean, I just think we ought to
8 observe here that we're talking largely about
9 internet-connected equipment in the long run,
10 and that that is a tool that ought to be
11 included in the tool box of the techniques
12 going forward, simply because it does provide
13 these potential solutions to some of the
14 problems that were discussed in here.

15 CHAIR TRAMONT: So, how do you
16 operationalize what you just recommended? I
17 mean, where would you -- what's the sentence
18 and where does it go?

19 MEMBER KAHN: Well, I'm not sure
20 where. That's a fair question. I mean, I
21 think -- I think maybe a discussion after the
22 geolocation databases, which is the closest I

1 can come that's in here, to say, you know,
2 going forward, since these are all too -- the
3 devices we are talking about are all digital
4 devices which will either be connected with
5 the internet or could be connected to the
6 internet at some long interval.

7 It is reasonable to consider
8 requiring, as part of certification, that
9 devices have to be recertified or reapproved
10 on some, you know, appropriate time interval.

11 I'm making words up on the fly
12 that's, you know, would probably be wrong,
13 Robert.

14 But, you know, I mean, I think
15 that's probably where you want to put it.
16 It's just to observe that so it's on the
17 record that that is a technique that would
18 give us at least one handle on some of these
19 kinds of questions.

20 MEMBER COOPER: Why not try just
21 to be very general in this report and I don't
22 think --

1 MEMBER KAHN: Say that again.

2 MEMBER PEPPER: Marty's saying we
3 tried to be general in the report, as opposed
4 to specific techniques that are requiring --

5 MEMBER KAHN: Well, I want to --
6 that's what I'm just saying -- I'm not trying
7 to be specific so much as saying the report
8 ought to recognize that, unlike the world that
9 existed where we sort of threw devices out
10 there and then they sort of existed for all
11 eternity.

12 Because of the technology we're
13 talking about, we can hypothesize a world in
14 which devices have, in fact, some shorter, you
15 know, approved lifetime that can be renewed.

16 That's a very general notion that
17 would at least begin to give us a handle on
18 some of these forward legacy issues, and maybe
19 some others.

20 CHAIR TRAMONT: Harold, and then
21 Karl and then Dale.

22 MEMBER FURCHTGOTT-ROTH: I think

1 we all recognize these are very contentious
2 issues.

3 MEMBER COOPER: A little louder,
4 please.

5 MEMBER FURCHTGOTT-ROTH: Sure.
6 Sorry, Marty. I have a very soft voice, but
7 I'll try to speak directly into the
8 microphone.

9 I think we all recognize these
10 unlicensed issues, we've had them over time
11 period, contentious issues and I -- I think
12 it's apparent the Subcommittee has struggled
13 mightily to come up with some balance.

14 And, Gerry, we're all very
15 grateful for your efforts and Marty's efforts
16 and everybody else who's participated on the
17 Subcommittee.

18 I have -- I share the concerns
19 that Greg has raised and that Janice has
20 raised, and others have raised over time.

21 Last month I submitted some edits
22 to try to reach some middle ground, some way

1 going forward, and a lot of it was focused on
2 the recommendation section which has not
3 really changed.

4 The two recommendations that I
5 personally could go along with are one and
6 three. One saying NTIA, Department of
7 Commerce, look more carefully at how you do
8 unlicensed sharing with federal users.

9 And, three, to the extent that
10 there are any new unlicensed bands that are
11 opened up, take a look at new technology so
12 that you don't have just the tragedy of the
13 commons for the lowest common denominator.

14 The two that I think are, frankly,
15 not support by this report and that I think a
16 lot of people probably have the most headache
17 with R-2 and 4.

18 I think the road map is not
19 supported by the document. I think it
20 reflects what I would characterize as a
21 planning approach to spectrum use rather than
22 a market approach.

1 It sort of has the government in
2 charge of doing a lot, rather than letting
3 innovation occur as it has historically. Most
4 innovation is not government-mandated. Most
5 innovation is the result of folks out there
6 figuring out a better mouse trap.

7 In four, the recommendation of an
8 additional -- of additional bands, I think, is
9 -- I think that actually is very
10 controversial.

11 So, the recommendation I would
12 make, that I think is operationally very
13 simple, would be to focus on the
14 recommendation section and retain
15 recommendations one and three and leave two
16 and four for another day.

17 CHAIR TRAMONT: Okay. Karl,
18 you're up next. Bob, are you up or is that a
19 legacy -- you're up. Okay. Karl.

20 MR. NEBBIA: Just some general
21 thoughts. First of all, I think the
22 recommendations are geared at being more kind

1 of visionary, some ideas, some direction for
2 the future.

3 I'm not sure that there is quite
4 so much consensus on that. There's certainly
5 a lot of strong voices for license use in our
6 community that don't seem to be at least --
7 come out strongly here.

8 People have argued that -- that
9 that's -- that is, in fact, the best way to
10 provide spectrum. But, nonetheless, we
11 understand that this text was supposed -- and
12 the work was supposed to be about unlicensed
13 spectrum use.

14 And for me, I appreciate the long-
15 term direction and I've noted this in my
16 conversation with the working group, my
17 struggle is, I have some real practical issues
18 that we're dealing with in terms of
19 enforcement, in terms of flexibility, even as
20 described here for future licensed users, and
21 that sort of thing, in terms of the devices
22 being in the hands of my grandmother and

1 grandfather and not wanting the FCC spectrum
2 police to show up at their door and say
3 "You're interfering with somebody."

4 These are real practical issues
5 that we're dealing with after, you know, many
6 years of unlicensed use. And I -- the issue
7 -- part of the issues that I raised is I found
8 the work lacking in dealing with those issues
9 and regardless of how many times I brought
10 them up, it still took a visionary approach.

11 Nonetheless, if that's the end
12 that we come to in this time, we'll get back
13 to those other issues. We'll have to get back
14 to those issues in detail in the future.

15 I also noted that in my sense,
16 we've had two working groups, one on sharing
17 and one on cognitive type radio. In the end,
18 I find us more of a voice for sharing in
19 cognitive radio than dealing specifically with
20 the aspects of issues related to unlicensed
21 use.

22 And it's not that we disagree with

1 more sharing, more cognitive capabilities, but
2 the aspect that something is not licensed, you
3 don't know who has it, that sort of thing
4 creates -- creates a different environment
5 than applying those same technologies to a
6 licensed environment.

7 So, -- and I felt like most of the
8 technology issues were dealt with more as if
9 this is the technology solution that we were
10 discussing outside of unlicensed versus
11 licensed.

12 And then, the last thing that I
13 find difficult in the document is the fact
14 that we do -- we do have approaches that we
15 take in our work where there are terms of art,
16 where there's certainly concepts that we use
17 that are the basis for our regulation
18 understanding.

19 And I find the discussion of
20 unlicensed particularly troubling in terms of
21 the fact, for instance, the terms "unlicensed
22 spectrum," is used throughout the document,

1 and regardless of how many times I red-lined
2 it or struck it out and changed it to
3 "unlicensed spectrum use," it always goes back
4 to "unlicensed spectrum," which is a concept,
5 at least in a legal or regulatory standpoint,
6 is not present in our current framework.

7 Now, maybe it is the goal in the
8 future, but it's not there now. Now, there
9 are some bands where there are additional
10 allowances made for the unlicensed user, some
11 specific bands, and if that's what we're
12 talking about, that needs to be clear, but I
13 feel like the wording goes back and forth,
14 always using this term "unlicensed use," and
15 we really don't -- I don't know what you mean
16 in the particular case.

17 Unlicensed use is never on a
18 secondary or primary basis. Secondary and
19 primary are terminologies that we use in the
20 allocation table related to authorized radio
21 services.

22 So, unlicensed use is not on a

1 secondary basis. It's on a noninterference
2 face that has no rights in the spectrum
3 currently, whatsoever.

4 So, when I look in the
5 recommendation four, and it talks about we're
6 going to do this, whether on a secondary
7 shared basis or primary, remember, secondary
8 and shared are not the same words. Okay.
9 They're not the same concept.

10 You can share primary services.
11 So, I found the document overall troubling in
12 the lack of linkage to the terms of art and
13 concepts that we use day in and day out.

14 So, I think that needs to be --
15 you know, as we go on, we're going to have to
16 deal with that one way or the other, whether
17 it gets changed here.

18 And the last thing I wanted to
19 mention here. For instance, in recommendation
20 four, it says that we recommend unlicensed
21 access to new bands, whether on -- secondary
22 share, I already talked about that, subject to

1 technical rules that will not create obstacles
2 to future reallocation or reorganization.

3 Well, I would challenge anybody to
4 define what that is because once you tell them
5 these are your rules and you're in there, it's
6 very hard to say it's subject to -- it's not
7 subject to that.

8 For instance, 900 megahertz, and I
9 should mention right now, as a reference
10 earlier to, maybe we should identify bands
11 that are great for short distance stuff.

12 Well, 900 megahertz and 2.4
13 gigahertz right now, I would say, are in the
14 heart of what people think are used for other
15 things, and yet they are the primary bands
16 right now that people relate to as unlicensed.

17 But I can tell you, the work in
18 900 megahertz, as successful as it has been,
19 has made it impossible to be used by some of
20 the licensed services that even are authorized
21 there, to the point where, when the Commission
22 came back to it, as part of one -- when one of

1 their licensees stepped up and said, "We want
2 access to our band," the Commission said,
3 "Well, we're going to redefine what
4 interference is here in this band."

5 So, I think we have to look at
6 those challenges, but certainly once -- once
7 you lay down the marker and say, "This is what
8 unlicenses allow," it's really hard to go back
9 and convince the licensed community that you
10 really have the flexibility to do whatever you
11 want, because it's been defined by the masses
12 of numbers of equipment out there.

13 MEMBER KAHN: Karl, but that is
14 one of the things I was trying to address. I
15 think you can think about saying this is
16 equipment, a priori we know that it has at
17 least a five-year, but no guarantee beyond the
18 five-year horizon.

19 And then the consumer and, you
20 know, space, and particularly in a consumer
21 space where what you're talking about is a
22 rapid turnover environment and

1 noninfrastructural-type environment.

2 That's actually very, very
3 reasonable. You know, you look at the average
4 life cycle of consumer electronics gear, you
5 know, if you said to people, "This will work
6 for five years, maybe more, but you're going
7 to have to renew it, and that gives you a
8 rolling horizon to take a certain class of
9 gear out of existence," that's not
10 unreasonable in that marketplace, and that's
11 very good for marketplace.

12 So, I think there are tools to go
13 after that, but I agree with you that it's a
14 real problem if you don't.

15 MEMBER CALABRESE: I'd like to,
16 just to clarify that answer -- is the
17 recommendation four was specifically intended
18 to address the concern you have, and so in the
19 body of the report, so on page 10, second, you
20 know, full paragraph, it talks about these
21 concerns about, you know, things like now we
22 have dumb devices, right, in the unlicensed

1 bands, so they become stranded legacy
2 equipment and infrastructure and it says,
3 "Some have recommended that the assignment of
4 bands for unlicensed or opportunistic access
5 may not need to be permanent or even long
6 term, as the TV white space order suggests
7 opening new bands for shared or even exclusive
8 access on an unlicensed basis need not
9 preclude reallocation or reorganization of the
10 band at a later date. The access to the bands
11 by unlicensed devices could be conditioned in
12 ways that reserve the flexibility to
13 reallocate a band in the future to change its
14 operating rules."

15 And that's explicitly what the FCC
16 did with the TV white space, because we have
17 to get permission from the -- get a list of
18 channels from the database. Tomorrow, any
19 particular channel can be pulled out and the
20 device simply doesn't have that channel as an
21 option.

22 And that was -- that's sort of the

1 intent, along with what Kevin, you know,
2 suggested as an additional example of
3 recommendation four.

4 So, it's actually a pro kind of a
5 -- it helps the flexibility of the regulator
6 in the future to change the allocation to
7 avoid stranded devices.

8 CHAIR TRAMONT: Okay. We have
9 some time issues and we have a lot of tents up
10 so let's try -- Bob, let's try and -- if you
11 can briefly --

12 MEMBER PEPPER: All I wanted to do
13 was -- yes.

14 CHAIR TRAMONT: Okay. Briefly,
15 and then I think what we are going to do is,
16 we are going to let Phil do his presentation
17 so he can get back to the people's business
18 across the street, and then we will come back
19 to the folks.

20 Both Brian, David and Susan have
21 their tents up, and then we'll find a path
22 forward because we do need to wrap up our

1 deliberations, so --

2 CHAIR HATFIELD: Yes, and I'd
3 really like people to think back, where it
4 seems like we're rearguing some pretty
5 fundamental things here, and I don't think --
6 here again, we don't have time to do that.

7 So, I would ask all the smart
8 people in the room to figure out a way that we
9 can -- we can move this forward and get it
10 done because, frankly, we're out of time. I
11 mean, literally, and I'm disappointed, I have
12 to admit, to see that we're still rearguing
13 these fundamental -- these fundamental things
14 at this last meeting, but that's --
15 nevertheless, that's where we are. That's
16 where we are.

17 CHAIR TRAMONT: Okay. So, Bob.

18 MEMBER PEPPER: So, I just wanted
19 to -- Michael said part of what I was going to
20 say. I wanted to respond to Harold on
21 recommendation four.

22 I don't think it -- it's not that

1 it calls for more, but rather in the context
2 of where there is opening up unlicensed
3 access, it be done in a way that actually does
4 not preclude, you know, future either
5 reallocation or other uses.

6 I mean, so it was -- if you -- if
7 you go past the first part -- the first
8 phrases it says, "Whether shared or exclusive,
9 subject to technical rules that will not
10 create obstacles to further reallocation or
11 reorganization."

12 I do think we, you know, maybe
13 we're not as precise in the language, as Karl
14 points out in terms of talking about, you
15 know, unlicensed spectrum versus unlicensed
16 uses or unlicensed devices, but to Dale's
17 point that, you know, we're essentially
18 running out of time and we should go back --

19 MEMBER BORTH: Actually we are.

20 MEMBER PEPPER: Yes. This is it.
21 We're not going to go back into it and rewrite
22 to the precision. It might have been better -

1 - it would have been better had the language
2 Karl, -- been not only more precise, but
3 consistent with the existing, you know, sort
4 of statutory references. That's always
5 better, right?

6 But, you know, we don't have the
7 time to do that, and I think that there's an
8 understanding that -- and we may want to put
9 it in a footnote that, you know, almost as a
10 translation -- when the report talks about
11 unlicensed spectrum, it's not really
12 unlicensed spectrum. It's unlicensed used on
13 licensed devices.

14 CHAIR TRAMONT: Okay. Thanks.
15 Bob, we're going to come back, but now we're
16 going to turn to Mr. Weiser, and then we'll --
17 Karl, your presentation, if it's all right,
18 we'll slide to later in the meeting, but I
19 want to try and be sensitive to Phil's
20 schedule.

21 So, we asked Phil to come by and
22 talk a little bit about the legislation and

1 the activities in the Administration related
2 to spectrum policy and brief us a little bit
3 on the thoughts that are occurring across the
4 street.

5 So, with that --

6 MR. WEISER: Well, it's really
7 great to see you, all of you again.

8 So, this is a very important
9 group, and as you get to the end of your
10 discussion about your next steps and role, I
11 wanted to be able to have you think about the
12 broad vision for CSMAC.

13 When you go back and look at the
14 NTIA report from October, which Karl and his
15 team worked very hard on, and both Larry --
16 particularly Larry and Alice put a lot into,
17 you can assure yourself that there weren't
18 things there that were not purposeful, and
19 that includes the role of CSMAC.

20 And the role of CSMAC in that is
21 meant to be a vanguard of the point that Bill
22 Joy often said, which is the smartest person

1 on the specific issue you're concerned with is
2 probably not working for you.

3 And so, the challenges -- and this
4 is a challenge to open government, in general,
5 is how do you provide tentacles out to where
6 the good ideas are. And that's something that
7 we all should be vigilant about.

8 You all are thought leaders and
9 exceptional public servants now in this
10 capacity and we want to call on that to give
11 ourselves what is probably a once-in-a-decade
12 opportunity, and maybe longer, maybe once in
13 a generation, to help catalyze an effective
14 spectrum policy reform effort.

15 Some of the issues that you all, I
16 would hope, are thinking about to give the
17 government and, in particular, legislative
18 context, some tools that we need to kind of
19 invent, go in the following order, and then
20 I'd love to get your thoughts and questions.

21 You guys have talked about the
22 need for how to think about incentives and the

1 different challenges. That is critically
2 important. The regime for sharing, say, two
3 agencies sharing, you know, with one another,
4 agencies finding ways to lease unused
5 capacity.

6 This is an unknown frontier that
7 we have to figure out how it would work, not
8 all that -- leave that to the legislation, but
9 we certainly want the legislation to enable
10 the sorts of opportunities that we think we
11 can take advantage of.

12 How do we give agencies more
13 insight into comfort with commercial
14 alternatives? One thing that the Department
15 of Defense routinely uses is commercial
16 satellites, for example.

17 That's something that, you know,
18 maybe all the time, some of the time is
19 thoughtfully and analyzed. Maybe there are
20 ways we could bake in other forms of analyses.

21 Maybe the budgetary issues make --
22 you know, A, B, C's go one way or the other.

1 You all have the chance to de -- you know,
2 start from the blue sky and think about ways
3 in which things can be structured. That is a
4 real benefit to the government to happen.

5 A second broad point. Test beds
6 and demonstration projects. One thing that we
7 don't have currently for our spectrum regime
8 is, you know, people who want to say, "Let me
9 kick the tires," so if you build the test bed
10 to try something and the agency's going to
11 say, "Before I commit to this, let me see how
12 it works."

13 Right now, under our current
14 tools, we don't have a great way to do that.
15 The spectrum relocation fund kind of says
16 you've got to commit to do this. We'll do the
17 auction and we'll pay you at the back end, but
18 they say, let me like see the study. Let me
19 see the demonstration project.

20 Right now that capability isn't
21 part of our toolbox, and some have suggested,
22 and you all can think, I think more deeply

1 about this, how that could be valuable and how
2 that could work.

3 Number three, others have
4 articulated the concept of an innovation fund
5 that could be related to part of this regime,
6 and this is something that fits with the
7 presidential memorandum, talking about
8 catalyzing new technologies and spectrum, and
9 that's something that you all should think --
10 let's say, it's dynamic spectrum active.

11 So, whatever it is, what
12 technologies would enable Federal agencies to
13 use spectrum more efficiently, are we
14 investing in those technologies today?

15 If you had an opportunity to make
16 investments that would pay dividends in this
17 arena, what would they be? How should we set
18 that up? How do we ensure the right
19 communications among the people who are
20 actually managing the spectrum, developing the
21 technologies, making these investments?

22 Fourth, and this is of critical

1 importance. I think I talked about this a
2 little bit last time. Public safety. Public
3 safety plays in this on multiple levels.

4 One level is the first claim of
5 revenues for the overall spectrum initiative
6 is public safety, and supporting a nationwide
7 broad band interoperable network. So that's
8 a critical goal.

9 But think about it from four
10 equities and in terms of looking at the
11 government's use of spectrum more efficiently,
12 if you build a public safety network, one of
13 the ideas that we are mindful of, and we had
14 a really great forum with public safety this
15 fall. A couple here may have had people who
16 were at it.

17 There's an opportunity to have
18 Federal agencies using the same network. It's
19 something the FCC called out in the broad band
20 plan, as public safety.

21 And that is an opportunity that we
22 all should be thinking about and some of the

1 technologies that we may want to develop could
2 be demonstrated in this new public safety
3 network, and that's something that, if there
4 are requirements -- folks who really know the
5 bureaucratic alphabet soup, the ECPC, which
6 I'm going to forget what that stands for,
7 Emergency Communications --

8 MR. NEBBIA: Preparedness Center.

9 MR. WEISER: See. Karl's got them
10 all down.

11 So, that's an effort by the
12 Federal government to take stock of what the
13 requirements are for all Federal users and
14 make sure that when we help finance a public
15 safety network, it has extensibility built in.

16 And finally, the document that
17 Karl and both Larry's sort of worked so hard
18 on has a couple of ideas that are sort of
19 embedded in it.

20 One, something that's referred to
21 as spectrum stat or basically taking the idea
22 of TechStat, which has been done by the CIO,

1 which is the more, you know, looking at how
2 spectrums are used and, you know, asking the
3 important questions, "Well, have you thought
4 about doing it this way?" which, in general,
5 is a good exercise, as you all might want to
6 think about, how would you organize such a
7 process so that it has maximum benefit.

8 But then, the other end of the
9 spectrum is the broad 20 to 30-year spectrum
10 planning opportunity that agencies may or may
11 not be fully taking advantage of, but that we
12 should be enabling them and providing valuable
13 feedback.

14 And, as I hope is evident, all
15 these pieces, these five pieces I've outlined,
16 they all fit together, and if they're all
17 going to work optimally, A, you need to have
18 the big picture and, B, you've got to go deep
19 in each of these areas.

20 And if you all think that the
21 government, alone, is going to do that
22 perfectly and with all the awareness, then you

1 haven't, obviously, been around government as
2 much because that's too much for government to
3 ask.

4 And as -- recall Bill Joy, we
5 don't have all the answers. We know there are
6 a lot of answers, insights, great ideas,
7 elsewhere, and one of the critical goals of
8 our overall spectrum effort, the document that
9 did a great job explaining it, is to reach
10 out, have tentacles into great ideas, bring
11 them in and bake them into our processes.

12 That's what CSMAC, I think, can be
13 doing over the next year, you know, I think
14 it's such an important body. I'm happy to
15 visit with you all as you all foster questions
16 on any of that.

17 CHAIR TRAMONT: Thoughts or
18 questions for Phil?

19 MR. WEISER: So, legislation -- I
20 guess what I'd say is, related to this is,
21 it's going to cover a number of key areas.
22 One is government spectrum.

1 Right. All these are fitting
2 closely with that. That's going to be a piece
3 of, I think, any legislation. You all
4 recognize and appreciate the Commercial
5 Spectrum Enhancement Act does an important
6 role, but it's missing some key tools.

7 That's Point one for the
8 legislation and most relevant. Point two,
9 incentive auctions for other licensees, some
10 I have talked with some of you about.

11 It's very important to say. Our
12 view is this is a voluntary opportunity that's
13 a win/win/win. It's an opportunity for
14 broadcasters, and I have had conversations
15 with some who see this opportunity.

16 The sharing that could happen
17 there is a valuable sharing, quickly, to give
18 people the idea, if I'm a broadcaster today
19 and I've got one standard definition channel
20 on the air, I can do it with another
21 broadcaster who can carry that for me, and let
22 my legacy spectrum assignment go, and that

1 frees up spectrum.

2 You'll later need to have probably
3 a repacking of the band because of reasons
4 that Dale has explained to me many times, and
5 that will create, I think, a huge efficiency
6 gain overall.

7 So, a benefit to broadcasters, a
8 benefit to the public who has a more efficient
9 spectrum system which helps support mobile
10 broad band, and then finally the Treasury gets
11 money that helps this public safety network.
12 That's another key piece of this legislation
13 package, and it's not an accident that the
14 efforts being discussed sort of do have those
15 all in it.

16 There's another piece that's worth
17 noting. I mentioned sort of this, how do we
18 catalyze innovation broadly? We're thinking
19 about their different ideas, you know, that
20 could be talked about and I think should be
21 talked about.

22 I think that's the core

1 components. There's a lot of interest on
2 Capitol Hill. We're quite optimistic that
3 this can happen, needs to happen.

4 The revolution that's happening in
5 4G is coming at a stunning pace, and if we
6 don't get spectrum out into the marketplace
7 and if we don't try to ride that revolution,
8 we're missing a huge opportunity.

9 So, we are very bullish on this
10 effort and the folks at NTIA are running
11 point, have been doing a terrific job. The
12 opportunities on all these dimensions, for
13 government use of the spectrum, to get more
14 spectrum out there in the private sector, to
15 develop more innovative technologies in this
16 area, and critically enable public safety to
17 have a network that it has longed for are real
18 and your all intellectual engagement in this
19 is a key part of our effort.

20 CHAIR TRAMONT: There's been a lot
21 of talk about inventory or transparency,
22 audits, things like that. What's the

1 Administration's views on transparency
2 generally on spectrum use and sort of the path
3 forward on those issues.

4 MR. WEISER: Well, sir, I think
5 there's a real interest as part of the things
6 I just said. You've got to have an inventory.
7 Right? So, if you're going to do anything
8 like strategic planning, if you're going to do
9 anything like spectrum stat, if you're going
10 to do anything about sharing with the
11 government, you need to know what it is, and
12 so it's an effort to do that.

13 So, that's a real thing that
14 there's commitment to, whether or not
15 legislation calls for it or not, we're
16 committed to seeing that through.

17 As for how that fits in with the
18 public transparency, there's an issue that has
19 to work out about that, but where it's able to
20 provide the public with transparent access as
21 part of, again, open government getting good
22 ideas, that is something that this

1 Administration wants to lean forward as much
2 as we can.

3 And that's something that, as you
4 all look at the opportunity for improvement,
5 if you see there are ways that transparency
6 can provide value, it's important to suggest
7 that, because that is a goal where we can
8 achieve it.

9 CHAIR TRAMONT: Any questions from
10 the group? Yes. Kevin.

11 MEMBER KAHN: Phil, was there a --
12 coordinate -- I mean, some of the things you
13 described, right, ultimately require, you
14 know, kind of leading edge research which is
15 like an NSF kind of mission.

16 Government spectrum, the NTIA
17 mission, commercial spectrum issues, the FCC
18 mission, and I just wondered to what extent,
19 you know, the Administration is seeing a way
20 to kind of really coordinate all of that so
21 that, you know, the -- you know, the NSF is
22 doing the -- or trying to get the right kind

1 of front-end research done so that some of the
2 test bed stuff actually does lead to a
3 convincing story that, you know, et cetera.

4 It's connecting the dot part.

5 MR. WEISER: So, I will say that I
6 have been very impressed with the level of
7 connective tissue focus on these different key
8 component parts.

9 People here may or may not have
10 heard of something called NITRD. There's
11 another acronym you need to learn in
12 government.

13 John, what does that stand for,
14 the Networking Technology --

15 MR. PEHA: Networking and
16 Information Technology Research and
17 Development Program.

18 MR. WEISER: So, John knows about
19 that because he's been helping out with that
20 over at OSTP. They are stewards of this
21 effort. There's a recent report that NITRD
22 had put out which talks about the opportunity

1 for R&D, including some on, I think, the
2 wireless spectrum as well.

3 That is well-appreciated by John
4 and others in OSTP who have been critical in
5 keeping all these dots connected. I think
6 your point is absolutely right. You have to
7 keep these dots connected for us to make the
8 type of improvements you need to do them in
9 tandem.

10 And so, I'd say at this point I'm
11 optimistic about that, but your caution and
12 nervousness is also warranted, because there's
13 always a challenge.

14 In any large organization, when
15 you have lots of different things going on,
16 making sure they stay connected.

17 CHAIR TRAMONT: Other questions
18 for Phil? Frank.

19 MEMBER FONTES: With respect to
20 public safety and its broad band network, is
21 it solely to look at public safety in terms of
22 having its broad band network or is it also

1 not only having its broad band network, but
2 also access to broad band networks where
3 public safety networks do not exist?

4 MR. WEISER: So I think I would be
5 -- strongly encourage people to think about
6 sort of capability and functionality as the
7 goal, and there's different types of control
8 that are possible and that may make sense in
9 different situations.

10 So, the overall goal is to enable
11 public safety to have the connectivity and the
12 capabilities that Federal Express has. Right.
13 The challenge today is, public safety has
14 essentially narrow band devices that have some
15 well-developed purpose, but are not
16 multipurpose tailored to public safety.

17 And so, if we can make that
18 transition for public safety, we think we can
19 get them more capable networks.

20 Now, the networks have to meet
21 their requirements. This is a critical role
22 that government has to be able to play. For

1 those who want to go deeper on that, we have
2 a sister agency here, NIST, which is doing a
3 phenomenal job out in Boulder.

4 I don't know if those -- have been
5 aware of that, but that is a huge opportunity,
6 right, to take the existing commercial
7 ecosystem and enable it to support and be
8 tailored to public safety as needs.

9 And if that can get developed
10 exactly how it gets implemented, I think your
11 point is a fair point, you know, it may not be
12 exactly the same everywhere because I think
13 one of the opportunities is to leverage
14 commercial infrastructure and we need to look
15 at what makes sense and develop what will be
16 a capability that will exist all across the
17 US.

18 CHAIR TRAMONT: Any other --
19 what's that? Any questions from folks on the
20 phone?

21 (No response.)

22 CHAIR TRAMONT: All right. Thank

1 you very much, Phil, for your time.

2 MR. WEISER: You're very welcome.

3 CHAIR TRAMONT: We appreciate it.

4 MR. WEISER: And I should say I
5 know that this is the last meeting for these
6 two good friends. You guys served us here,
7 over this period of several years it has
8 really been spectacular. So, thank you folks
9 very much.

10 CHAIR TRAMONT: Thank you, Phil.
11 We appreciate that.

12 So, with that, we have a couple of
13 tents up related to the report. I'd like to
14 try and make sure -- and then we have another.

15 I'd like to try to get a --
16 finalize a discussion of concerns that people
17 have about the draft, and I think we'll do a
18 break so that everything's on the table, and
19 come back with a -- getting to closure on what
20 we're doing.

21 So, I want to make sure we have a
22 chance for everyone to express their views so

1 we have the universe defined, and then we can
2 move to whatever our resolution is.

3 So, with that, David, then Susan,
4 then Gerry.

5 MEMBER DONOVAN: Thank you. By
6 way of potential solution here on
7 Recommendation number Four, considering what
8 Mike just said, and also what Karl said, and
9 both have raised some very good points.

10 Suggestion, if we edit the
11 following. Finally, we recommend that NTIA
12 and the FCC consider opening unlicensed access
13 to new bands, strike, whether on a secondary
14 or shared or primary basis, because I think
15 that Karl's point, what we're talking about is
16 -- is on a noninterfering basis because
17 unlicensed does not have either a shared or
18 secondary status.

19 So, considering all the unlicensed
20 being to new bands, subject to the technicals,
21 it will not create obstacles to future
22 reallocation or reorganization of the band due

1 to the risk of substantial stranded -- and
2 this goes to the point, Michael, that I think
3 you raised.

4 We're talking about stranded
5 unlicensed devices, correct, as opposed to
6 licensed devices. So, insert the word
7 "unlicensed," before the word "devices," and
8 their support of infrastructure.

9 I think what that does is, it
10 solves some of Karl's problems. I don't think
11 it does damage to the concept, inserting the
12 word on a noninterfering basis to the extent
13 this recommendation can be extended to
14 sharing. I think that resolves that problem.

15 I think one of the things about
16 obstacles to future reallocation or
17 reorganization, it wasn't clear to me from the
18 recommendation as to whether or not you were
19 essentially dismissing, concerned about
20 stranded licensed equipment.

21 CHAIR TRAMONT: Right --

22 MEMBER REASER: And I don't think

1 that's what you meant.

2 CHAIR TRAMONT: Right --

3 MEMBER REASER: So that's why I
4 inserted the word "unlicensed," but I think
5 that resolves some of that. Hopefully, that
6 will --

7 CHAIR TRAMONT: Can-- Can I propose
8 a friendly amendment to -- based on some other
9 concerns that have been raised?

10 As I understood what this
11 recommendation was designed to do, it was
12 designed to raise factors that should be
13 considered if there were reallocations, right.

14 Factors to be considered, and any
15 government decision to open new bands to
16 unlicensed. I did not get the sense from the
17 Committee that they were recommending
18 additional unlicensed bands, per se, and I
19 thought Janice and Harold and others have
20 expressed concern about being too far out in
21 front of that idea.

22 So, what I wondered is, if, in

1 addition to David's edit, if we just said
2 finally in any consideration of opening
3 unlicensed access to new bands, rather -- and
4 so that it just becomes neutral on the
5 recommendation of additional spectrum.

6 I mean, at some level this is
7 overtaken by events, the Administration and
8 the FCC have called for additional unlicensed
9 spectrum, so I don't know that it's worth
10 getting a huge -- hugely concerned about that,
11 but to the extent that the report was not
12 designed to be a call for additional spectrum,
13 but rather was designed to address if
14 unlicensed spectrum is designated, unlicensed
15 spectrum use is designated, then it should
16 have these considerations.

17 I think that might -- to be a two
18 for --

19 MEMBER BORTH: You clarify what you
20 are saying.

21 CHAIR TRAMONT: Right. But I was
22 going to say when, you know, finally --

1 MEMBER REASER: Okay. So --

2 CHAIR TRAMONT: Okay. So, if and
3 when. So, that's Recommendation Four. Thank
4 you, David.

5 Susan, you're next up and then
6 Gerry's next.

7 MEMBER CRAWFORD: Yes. That was
8 very helpful. I was going to do whatever I
9 could to rescue the report and move on.

10 CHAIR TRAMONT: Thank you.

11 MEMBER CRAWFORD: I'm also
12 troubled by the deep misfit between what Phil
13 is asking for help on and what we immediately
14 descend to, which is wordsmithing on
15 particular recommendations.

16 So, whatever we can do to blow up
17 the committee, start again, you know, make it
18 more useful to NTIA, I think is going to be a
19 good idea.

20 I was actually going to suggest --
21 you wanted to move on -- that we -- we delete
22 Three and Four and just hang onto One and Two

1 so that we can not worry about whether
2 specific recommendations are being made for
3 opening up unlicensed bands, but really focus
4 on the considerations that will be appropriate
5 when -- when those bands are used for
6 unlicensed purposes.

7 And I had one other suggestion,
8 which was to try to cap the report with a
9 sentence that might deal with people's
10 concerns, and this is the sentence.

11 "The report assumes the continued
12 existence of unlicensed uses and suggests
13 steps that could lead to more efficient
14 unlicensed uses as well as enhanced sharing
15 among users, licensed and unlicensed," and
16 then that is what this report is about.
17 That's all it's trying to do.

18 You know, it may not have been
19 perfectly drafted, but it was the effort of
20 this subcommittee and I want to support it and
21 then start all over again.

22 MEMBER SALEMME: So, just to build

1 on Susan's great assistance, I would actually
2 suggest you add that sentence to the end of
3 the first paragraph so that it captures it
4 right up front --

5 MEMBER CRAWFORD: Right.

6 MEMBER SALEMME: -- right up front
7 to help address Greg, Janice's and Harold's
8 efforts, because that is what was an attempt.

9 I would take -- you know, again, I
10 don't want to go further on number two, but
11 one of the things you could do is merge One
12 and Two and, instead of actually calling for
13 a road map, just try to capture it so that the
14 -- instead of -- we start Two by saying
15 "further," and then go to the second sentence,
16 "Since this document spectrum and technology
17 advances have proceeded in the past as a
18 result of evolving users, requirements and new
19 technology capabilities, so you capture the
20 theme that Marty was trying to get at.

21 I mean, again, you know, but
22 Harold, that's fine. I don't want to do it,

1 then, if it's problematic, but -- but instead
2 of having a -- you know, a report, just say
3 that it's among the things that NTIA, in
4 concert with the FCC should consider, that
5 they look at the fact that rules do have a
6 role to play in what technologies have come
7 forward.

8 CHAIR TRAMONT: Okay. So, I'm
9 sorry, what was the -- what was your actual
10 proposal?

11 MEMBER SALEMME: That you --

12 CHAIR TRAMONT: You keep the whole
13 thing?

14 MEMBER SALEMME: -- move away from
15 a technology road map, but instead just try to
16 capture the fact that emerging in one, the
17 Department of Commerce, NTIA, in concert with
18 the NTIA -- with the FCC, should be reviewing
19 rules and provide objective benchmarks for
20 agencies that need to evaluate performance
21 regarding a doctrine of spectrum-efficient
22 technologies and could inspire service

1 providers and manufacturers to research.

2 You take the end of what you were
3 trying to capture with the road map and have
4 that as one of the criteria that the NTIA
5 could be looking at.

6 MEMBER CRAWFORD: So you no longer
7 have that.

8 MEMBER SALEMME: So you no longer
9 an actual technology road map, but you are
10 actually looking for objective benchmarks and
11 you want to evaluate performance on spectrum
12 efficiency to see whether that will inspire
13 more sharing and better use.

14 MEMBER COOPER: The essence of
15 this road map proposal would have been to get
16 some objective source to provide guidance to
17 policymakers about technology. So I hope we
18 don't dilute that objective.

19 MEMBER SALEMME: Right. So
20 however it's done it's not dictating, you
21 know, it's not a managed government versus,
22 you know, should it be one of the things that

1 you're looking at and are they -- does it seem
2 impossible to do it-- but again, --

3 MEMBER FURCHTGOTT-ROTH: Look, I
4 think there probably are a lot of good ideas
5 in the second recommendation that it be
6 preserved. I have to say, of all the things
7 in that paragraph, the one that really is --
8 alarms me the most is the second sentence,
9 that --

10 MEMBER SALEMME: Okay. That's
11 fine.

12 MEMBER FURCHTGOTT-ROTH: -- the
13 government is saying that -- that the
14 government created user requirements that led
15 to technology advances and is not something
16 that --

17 MEMBER SALEMME: It doesn't say
18 that. Marty's point was --

19 MEMBER FURCHTGOTT-ROTH: It says,
20 "The result of evolving use requirements --

21 MEMBER SALEMME: That's right.
22 That's all of them.

1 MEMBER FURCHTGOTT-ROTH: What's a
2 user requirement?

3 Member Warren: I need to --

4 MEMBER CRAWFORD: Mobility.

5 PARTICIPANT: What are valid?

6 MEMBER FURCHTGOTT-ROTH: Well, as
7 an economist, I am really troubled by that, so
8 --

9 (Simultaneous speaking.)

10 MEMBER FURCHTGOTT-ROTH:
11 "Requirement" sounds -- "requirement sounds
12 like something of --

13 (Simultaneous speaking.)

14 CHAIR TRAMONT: Needs?

15 MEMBER FURCHTGOTT-ROTH: Needs --
16 usage. Oh, okay. All right.

17 CHAIR TRAMONT: That's what it's
18 actually meant to use --

19 MEMBER FURCHTGOTT-ROTH:
20 "Requirement" sounds very mandatorial.

21 CHAIR TRAMONT: Okay. So, Greg,
22 let's get your concerns on the table, and then

1 let's -- let's --

2 MEMBER ROSSTON: So, in an effort
3 to move forward, so I firstly should have
4 compliment you all on the effort that's put
5 into this requirement --

6 (Off-the-record comments.)

7 MEMBER ROSSTON: So, my first
8 thing that I think would make me happier was,
9 rather than appending Susan's sentence to the
10 end of the first paragraph, replacing the
11 first paragraph, Susan's sentence, I think
12 there was enough loaded stuff in that first
13 paragraph that Susan's sentence sort of says,
14 "Here's what we're doing."

15 And that was -- that was the first
16 thing that I would like to propose as a
17 possible change that way. Should I go through
18 a whole list of things, or do you want to go
19 through -- because, I had a few other things
20 throughout that gave me heartburn through --
21 what?

22 (Off-record remarks.)

1 CHAIR TRAMONT: Can you give an
2 overview of what they are --

3 MEMBER ROSSTON: So basically,
4 other -- they're basically things throughout
5 here that are -- I think could be corrected by
6 editing through -- you know, other smaller
7 things could be corrected by editing.

8 I don't know if we can adopt this
9 with small edits that change the tone --

10 CHAIR TRAMONT: Well, I think it's
11 important the Committee, though, embrace the
12 concept that --

13 MEMBER ROSSTON: Okay.

14 CHAIR TRAMONT: -- you're
15 implementing here.

16 MEMBER ROSSTON: So, for example,
17 there's -- then I'll go through these quickly.
18 "Consequently," on paragraph -- page three,
19 the first -- second full paragraph,
20 "Consequently, quality of service, the primary
21 differentiator," seemed like an odd thing.
22 I'm not sure that's the primary differentiator

1 between a licensed and unlicensed regime, is
2 quality of service.

3 CHAIR TRAMONT: Page three, the
4 first full paragraph.

5 MEMBER ROSSTON: Oh, I must have
6 the old version, then.

7 (Simultaneous speaking.)

8 MEMBER ROSSTON: Okay. Good.
9 Good. Okay. Good. So, I'm glad -- glad
10 that's --

11 So then I had -- I didn't -- I
12 didn't like the -- yes, page five in the
13 "Contributed to the need for a" -- "Spectrum
14 scarcity has contributed the need for licensed
15 allocation," and then basically the bottom of
16 this seemed to me -- I liked the technology
17 that went on beyond it, but I think that just
18 the lead-in to it was, it's got -- there have
19 been technology advances -- I think there
20 should be a lead-in that says there's been
21 technological advances and things that
22 operators have done to try to mitigate this

1 problem.

2 I just -- I didn't think it was,
3 you know, sort of ending this process,
4 "results in wasted energy and unused spectrum
5 capacity, but people have done things to
6 address it," I think would be something --
7 something along that line would give me less
8 heartburn on that.

9 And then, moving forward,
10 obviously the part that I read earlier on the
11 challenge was substantial -- that first --
12 first paragraph -- the first sentence of that
13 under the challenge is --

14 MEMBER DONOVAN: I've lost you,
15 Gerry.

16 MEMBER ROSSTON: Page nine.

17 MEMBER DONOVAN: Page nine.

18 (Off-record comments.)

19 MEMBER ROSSTON: Okay.

20 MEMBER FURCHTGOTT-ROTH: And then
21 the first sentence in the second paragraph.

22 MEMBER ROSSTON: Yes. I mean,

1 "Virtue of necessity," is -- it seems like an
2 odd thing to, as an economist to think about.
3 And also in there, "Users had no choice in
4 stimulation by the FCC." Those were things
5 that I had concerns with in this paragraph.

6 CHAIR TRAMONT: Okay. So we would
7 -- So we would strike the first sentence.

8 MEMBER WARREN: So you want to
9 strike the first paragraph, in the first
10 sentence, and I'll second that.

11 MEMBER ROSSTON: We need to make
12 an introductory something before we get to the
13 exam --

14 CHAIR TRAMONT: Yes.

15 MEMBER ROSSTON: I mean, maybe we
16 could -- we could say -- I mean, the "Virtue
17 of necessity," I think was designed to have
18 arisen through the market.

19 PARTICIPANT: In the market or by
20 --

21 MEMBER ROSSTON: Or by government
22 --

1 MEMBER WARREN: Or by government--

2 MEMBER ROSSTON: Yes. Does that
3 get you there or not get you there?

4 MEMBER WARREN: What is it, market
5 incentives or by government's --

6 MEMBER SALEMME: Market. You're
7 an economist, you love markets.

8 (Simultaneous speaking.)

9 MEMBER WARREN: Or by some
10 government stimulation, I mean --

11 CHAIR TRAMONT: Right. For
12 command and control spectrum --

13 MEMBER WARREN: Right.

14 CHAIR TRAMONT: -- people lose
15 more efficient technologies only when they are
16 commanded to do so. In the market they do it
17 on their own because they have
18 internalization, costs. There you go. My
19 best effort is --

20 (Simultaneous speaking.)

21 MEMBER OBUCHOWSKI: That is
22 exactly what didn't happen in the 900

1 megahertz bands.

2 PARTICIPANT: Absolutely what
3 happens in the --

4 (Simultaneous speaking.)

5 CHAIR TRAMONT: Okay. So,
6 historically, use of efficient technologies
7 have arisen through the market, or by
8 government decision --

9 (Simultaneous speaking.)

10 CHAIR TRAMONT: Well, I'm looking
11 to Greg to see if we --

12 PARTICIPANT: He said yes, he
13 thinks --

14 CHAIR TRAMONT: He's good. He's
15 looking at Harold.

16 MEMBER FURCHTGOTT-ROTH: Because,
17 as often as not, it's government decisions
18 that led to less efficient use of technology.

19 If this sounds one-directional, it
20 just -- I -- there are people around this
21 table who have word stories.

22 MEMBER WARREN: You've been with

1 the FCC, right?

2 CHAIR TRAMONT: Well, it's both --
3 both --

4 MEMBER WARREN: I'm not thinking
5 of the FCC --

6 (Simultaneous speaking.)

7 MEMBER REASER: There's millions
8 of dollars developing spectrum efficiency.
9 There's a rush of technology, we've built a
10 whole class of E band for, you know, E-Class
11 for amplifiers. There's been lots of stuff,
12 you know, in the government -- at least we
13 dealt with a lot of that stuff.

14 I had huge programs that I used to
15 run to get more spectrum-efficient, to use
16 less spectrum.

17 (Simultaneous speaking.)

18 MEMBER SALEMME: There certainly
19 have been examples where spectrum efficiency
20 have arisen by, you know, through the market,
21 and it's all at government expense.

22 MEMBER CRAWFORD: It's just

1 examples.

2 MEMBER SALEMME: Just examples.

3 It doesn't happen all the time. Sometimes
4 it's bad. Sometimes they'll make decisions
5 that's bad, and there'll be examples when they
6 do things right.

7 (Simultaneous speaking.)

8 CHAIR TRAMONT: Okay. Is that
9 right?

10 MEMBER SALEMME: Historically
11 there have been -- there are examples with --

12 CHAIR TRAMONT: What else have you
13 got, Greg?

14 MEMBER SALEMME: Okay. But also
15 the fact stimulated by -- situated by the fact
16 that the users had no choice.

17 CHAIR TRAMONT: This is under the
18 --

19 MEMBER ROSSTON: Continuing just
20 about four lines down.

21 CHAIR TRAMONT: This is the land/
22 mobile sentence.

1 MEMBER ROSSTON: Yes.

2 CHAIR TRAMONT: I don't think -- I
3 mean, if we want to take out that clause --
4 how about -- it probably says continuous. You
5 know, to improvement evolved over a period of
6 40 years, period. Right?

7 MEMBER ROSSTON: Right

8 CHAIR TRAMONT: Okay. Next?

9 And then the FCC mandated trunk
10 systems. Yes. Okay. Okay?

11 (Off-the-record comments.)

12 MEMBER ROSSTON: Okay. And then I
13 move to page ten, the first full paragraph,
14 first sentence -- or the second, sorry. "I
15 have closely-related concern," and it says,
16 "Both unlicensed and licensed bands will be
17 littered with legacy devices that no
18 particular entity has the ability or incentive
19 to retire," and I just don't think that's true
20 because if you look at the cellular values,
21 they did have the incentive to retire the
22 legacy devices so they could reclaim the

1 spectrum, and they did.

2 So, I think that's just not
3 factually accurate.

4 MEMBER CRAWFORD: How about "Will
5 have difficulty retiring and replacing"? Just
6 not take a --

7 MEMBER PEPPER: The difficulty is
8 different than having a sentence. I mean, I
9 think Susan's suggestion would be best.

10 MEMBER ROSSTON: But I think
11 there's a fundamental difference --

12 CHAIR HATFIELD: But I don't think
13 it's true for license.

14 MEMBER ROSSTON: I think there's a
15 fundamental difference that unlicensed guys
16 don't have -- rather than trying to mash them
17 both into the same sentence, I think there is
18 a fundamental difference between licensed and
19 unlicensed --

20 (Simultaneous speaking.)

21 MEMBER ROSSTON: -- and we should
22 try to separate the two, and we just --

1 (Simultaneous speaking.)

2 MEMBER CALABRESE: There is a risk
3 -- you could say there is a risk that
4 unlicensed bands will be littered, because
5 that's what Recommendation Four addresses, is
6 the risk --

7 CHAIR HATFIELD: It occurs in the
8 licensed band, too. People say, "Look, I've
9 got this phone too, they go to the Hill and
10 say, "Hey, they're trying to have obsolete the
11 phone that I just bought a year ago."

12 (Simultaneous speaking.)

13 CHAIR TRAMONT: The person doesn't
14 have any control. Let's just focus on whether
15 anybody has an ability to control them.

16 You know what I mean? I agree
17 with you that it would still happen that they
18 argue, we have the ability to control.

19 (Simultaneous speaking.)

20 CHAIR HATFIELD: And actually,
21 they have the technical ability --

22 CHAIR TRAMONT: And there's a

1 risk.

2 CHAIR HATFIELD: All right.

3 MEMBER WARREN: I'm sorry, can I
4 just ask one clarification. I mean, I know
5 everybody here is focused on FCC licensed
6 bands, but there are unlicensed devices in
7 bands that are -- have assigned spectrum for
8 government use, and therefore, don't they
9 qualify as license bands in this discussion
10 here.

11 So, I'm a little concerned by --

12 CHAIR TRAMONT: Oh, I see.

13 MEMBER WARREN: -- by unlicensed
14 because it's -- I'm sorry. Let me just
15 finish.

16 I think what we're talking about
17 is unlicensed devices or legacy devices in
18 bands that have both unlicensed and/or
19 licensed uses, and I think if you get rid of
20 licensed bands you lose that element and I
21 think that's an important factor here.

22 MEMBER ROSSTON: How about

1 unlicensed devices as opposed to unlicensed
2 bands --

3 CHAIR TRAMONT: Because that gets
4 you to --

5 MEMBER PEPPER: And this goes back
6 to Karl's earlier --

7 CHAIR TRAMONT: Yes. So, I think
8 striking the part about bands and out of
9 literally unlicensed legacy, unlicensed
10 devices -- okay.

11 MEMBER ROSSTON: I was a little
12 troubled as for the bigger picture on the --
13 you know, that -- I guess the footnote 13 does
14 -- it does help me, to some extent, but --

15 (Simultaneous speaking.)

16 MEMBER ROSSTON: Footnote 10. I
17 apologize.

18 I don't know, it seemed like
19 that's an important point is, that it is
20 theoretically much harder to go from having a
21 licensed band to an unlicensed band -- or,
22 sorry, to go from an unlicensed -- I don't

1 want to call it "band."

2 Allocation for unlicensed devices
3 to a licensed regime in the other direction.

4 MEMBER CALABRESE: I would strike
5 that footnote because it's obvious that the TV
6 white space order has not even been
7 implemented yet. So I don't think that's even
8 needed.

9 MEMBER DONOVAN: We don't know
10 yet. The most recent activity that we have is
11 a movement of unlicensed wireless microphones
12 out of the 700 megahertz band, and it's not
13 clear at all whether or not that's worked.

14 MEMBER WARREN: So can we say that
15 this concept still needs to be approved.

16 MEMBER DONOVAN: Well, that's what
17 it is, it worked in a practical sense.

18 MEMBER WARREN: Right. I know.

19 That's --

20 MEMBER DONOVAN: The Jello isn't
21 ready.

22 MEMBER WARREN: Right.

1 CHAIR TRAMONT: Okay. Greg, what
2 else have we got?

3 MEMBER ROSSTON: Then it was just
4 -- I did the points on the recommendations, if
5 we could get -- just that we all talked about
6 -- and I guess -- I guess the edits, to the
7 extent --

8 Recommendation 3 still kind of
9 seems odd to me, to design a band as opposed
10 to rules for a band, and that sort of thing,
11 you know, that encouraging the development of
12 spectrum-efficient technologies, you would
13 want to design rules, not design a band.

14 (Simultaneous speaking.)

15 But I think this -- we're not
16 recommending new bands, so it is to say, if
17 one or more bands is designated for unlicensed
18 use, if and when -- same -- same language.

19 CHAIR TRAMONT: Yes. Right.
20 Anything else? Greg?

21 MEMBER ROSSTON: That's it for
22 now.

1 CHAIR TRAMONT: No, no. Let's be
2 clear.

3 (Simultaneous speaking.)

4 CHAIR TRAMONT: If someone else
5 says something -- actually, I'm very sorry.
6 Is that your -- you're up, David?

7 MEMBER DONOVAN: Yes. One quick
8 question again, and this is totally up to
9 Karl. I know you are concerned about lack of
10 specificity in the recommendations that we
11 could use.

12 We've dealt with a lot of very
13 specific recommendations for sharing both
14 licensed and unlicensed in the interference
15 report. I didn't know whether or not before
16 we got to the recommendations whether or not
17 you wanted that cross-referenced, which may
18 help in terms of just getting some specific
19 recommendations as to how this should be
20 implemented.

21 MR. NEBBIA: I think the more
22 specificity, when it comes to implementing it

1 and when it comes to as the coordinator for
2 this group has to do, Joe has to count and
3 report to the powers that be about how we deal
4 with the recommendations if they don't jump
5 out clearly.

6 I mean, I can look at
7 recommendations two paragraphs long, and it
8 really gets hard for me to figure out, well,
9 what's -- what is the recommendation that I
10 then have to report back and say we either did
11 this or didn't do it.

12 So, to me, once again, single,
13 clear specific recommendations are always --

14 MEMBER DONOVAN: So if we wanted
15 to drop a footnote cross-referencing your
16 recommendations which dealt with essentially
17 some of these more general concepts.

18 MR. NEBBIA: But that's what we're
19 -- I mean, we're going to be going to that
20 other report whereas --

21 (Simultaneous speaking.)

22 MEMBER DONOVAN: Because I hate to

1 create the essence that somehow now we've
2 created a super recommendation here that
3 somehow is going to be counted differently
4 than looking at --

5 CHAIR TRAMONT: I want to go to
6 break.

7 Rick, do you have something new?

8 MEMBER REASER: I was just going
9 to say, why don't you just bold the first
10 sentence and say it's the recommendation.

11 CHAIR TRAMONT: Okay. So, anybody
12 else on the phone have anything?

13 (No response.)

14 CHAIR TRAMONT: Okay. We're going
15 to take --

16 CHAIR HATFIELD: Could I insert --
17 I hate to do this since I've been switching
18 things, but on page five, the first article,
19 paragraph, there's a whole description of what
20 AT&T is doing, and I can't help but put my
21 college professor had on it, says, that begs
22 for a site.

1 Since we don't have anybody, I
2 believe in the room who actually works for
3 AT&T, we're making assertions about what
4 they're doing and I think just a simple
5 footnote -- I'm not asking for any change as
6 substance or whatever --

7 MEMBER KAHN: It is certainly --
8 certainly beats walking into Starbucks iPhones
9 on AT&T.

10 (Simultaneous speaking.)

11 CHAIR HATFIELD: What struck me is
12 they're saying they're using a mesh network
13 and I personally was not worried that they
14 were using a mesh network technology.

15 (Simultaneous speaking.)

16 MEMBER PEPPER: Can I -- if a site
17 can't be found, it shouldn't be there.

18 CHAIR TRAMONT: That would be
19 great. Okay. So on the phone, anybody else
20 have anything?

21 I noted by the chuckle before I
22 had actually let them say anything, and so,

1 what we're into is, caucus in the break, come
2 back in ten minutes with a summary of what
3 we're proposing to change and then we will
4 vote and then we will move on to Karl and
5 Larry's presentation, and then we will wrap
6 up.

7 So, ten minutes, and then we
8 reconvene here.

9 CHAIR HATFIELD: Please, everybody
10 focus on getting this done.

11 (Whereupon, the above-entitled
12 matter went off the record at 11:23 a.m. and
13 resumed at 11:34 a.m.)

14 CHAIR TRAMONT: Okay. If we could
15 have everybody take their seats, we will
16 reconvene.

17 Okay. So, when we adjourned we
18 were going to get a summary of the changes.
19 Gerry has done a yeoman's work in the last 10
20 or 15 minutes.

21 So, the path forward will be as
22 follows. Gerry is going to give an overview

1 of the edits that are going to be made.

2 If you're all going to say we're
3 all going to weigh in on whether or not those
4 are -- they appropriately capture the
5 conversations we've had here this morning.

6 He will then recirculate the
7 draft, later today or tomorrow. So, it's
8 going to be adopted with editorial privileges
9 today and then assuming that there -- everyone
10 is fine with that, they will be adopted on
11 Wednesday, the final day of the committee.

12 So, that is the approach we're
13 going to take and we'll be adopting the
14 editorial privileges and we are going to rely
15 on Gerry and his team to implement the edits
16 as articulated in the following discussion.

17 Okay. Any questions on process
18 before we move to this?

19 All right. Mr. Salemme.

20 MEMBER SALEMME: So, to start on
21 page one with deleting the first paragraph and
22 replacing it with the language that Ms.

1 Crawford has suggested.

2 "The report assumes a continued
3 existence of unlicensed use and suggests steps
4 that could lead to more efficient unlicensed
5 uses, as well as enhanced sharing among users,
6 licensed and unlicensed."

7 The next change is on page five,
8 at the end of the paragraph, Greg's suggestion
9 that we add "This process results in wasted
10 energy and unused spectrum capacity that may
11 prevent others from sharing the radio
12 spectrum, but there have been cases where
13 technological advances have mitigated this
14 concern."

15 CHAIR TRAMONT: Okay. We're also
16 adding the site for AT&T, NTIA as well.

17 MEMBER SALEMME: All right. Site
18 for AT&T, right, I have a --

19 Page eight we have the edit from
20 Brian

21 CHAIR TRAMONT: Page seven you
22 have what Bob Pepper added.

1 MEMBER SALEMME: Oh, Bob Pepper.

2 CHAIR TRAMONT: At the bottom of
3 seven.

4 MEMBER SALEMME: Oh, I've got the
5 wrong sheet here.

6 (Simultaneous speaking.)

7 MEMBER SALEMME: Right. That's
8 with notes on the next page.

9 MEMBER CALABRESE: You have the
10 edit on page eight.

11 MEMBER SALEMME: Yes. We have the
12 edit on page eight. Do you want me to read it
13 or --

14 CHAIR TRAMONT: I read it before.

15 MEMBER SALEMME: Okay. We read it
16 before. We have Kevin's suggestion at the end
17 of the last -- the first paragraph --

18 MEMBER KAHN: Yes. What I was
19 going to suggest is, in that section right --
20 right before the challenge on page nine, one
21 more bolded paragraph like geolocation
22 databases that would -- do you want the read

1 of it?

2 It would be something like, the
3 heading would be "Infield Reauthorization,
4 finally, it should noted that virtually all
5 future devices that are candidates for use in
6 unlicensed bands will or could be designed to
7 intermittently contact the internet which
8 would be considered to require the
9 certification of such devices that they have
10 potentially bounded by requiring them to re-
11 authorize over the network in some
12 appropriately long interval.

13 "This would provide one possible
14 way to obsolete such legacy devices over
15 multiyear time frames."

16 MR. NEBBIA: Except without the
17 right reference to unlicensed bands.

18 MEMBER KAHN: Sorry?

19 MR. NEBBIA: Except without the
20 reference to unlicensed bands.

21 CHAIR TRAMONT: Right.

22 MEMBER KAHN: Oh. Yes. Okay. I

1 was writing quickly here.

2 MEMBER SALEMME: Okay. Further,
3 on page nine, the first paragraph under the
4 challenge section is deleted.

5 The next sentence, "Historically,
6 in some cases new spectrally-efficient
7 technology" -- there have been cases where new
8 spectrally-efficient technologies have arisen
9 by virtue of market forces or by government
10 decision.

11 (Simultaneous speaking.)

12 MEMBER SALEMME: All right. Then,
13 in the sentence -- the third sentence in that
14 paragraph, "This improvement evolved over a
15 period of 40 years but progress was
16 continuous." We delete the rest of that
17 sentence.

18 Ten, we did not have to make any
19 changes on ten. Okay. We get to the
20 recommendations.

21 (Simultaneous speaking.)

22 MEMBER CALABRESE: We used devices

1 there, correct?

2 MEMBER SALEMME: Yes.

3 MEMBER PEPPER: Along that line,
4 is it -- Karl had noted that there were a
5 number of places throughout the report that
6 refers to unlicensed bands.

7 MEMBER SALEMME: Right.

8 MEMBER PEPPER: Would it be
9 possible to go through and just through the
10 whole report and change that from "unlicensed
11 bands," to either "unlicensed uses and/or
12 devices"?

13 MEMBER SALEMME: Yes.

14 (Simultaneous speaking.)

15 MEMBER SALEMME: I thought we did
16 a -- I thought we did it once, except for that
17 one section, but we'll try one more time.

18 MR. NEBBIA: Yes. I think it's
19 just important when you do that, that there
20 may be cases in here where the idea of setting
21 aside unlicensed spectrum of unlicensed bands
22 is the intent, and there you need to do it

1 separately, but that's not the intent for most

2 --

3 MEMBER SALEMME: Right. That's
4 right.

5 Okay. Well, that will be a good
6 general effort to clear that language. And
7 then, on the recommendations, we'll delete
8 Recommendation Two, merge some of the concepts
9 into the first recommendation.

10 Recommendation Three, the
11 Committee also recommends it and when one or
12 more new bands is designated for unlicensed

13 MEMBER CALABRESE: Use.

14 MEMBER SALEMME: -- use. Right.
15 That they design rules, right --

16 That they be designed, the rules
17 be designed? That the rules -- right. That
18 the rules, right, that the rules be designed.
19 Okay. That's it for Three.

20 On Four, similar language.

21 "Finally, we recommend if and when NTIA and
22 the FCC considers opening unlicensed use to

1 new bands," but delete the rest of it, "it
2 will establish technical rules that are
3 designed" -- "it will design technical rules."

4 CHAIR TRAMONT: And then stranded
5 and unlicensed devices and infrastructure.

6 MEMBER SALEMME: Right. On the
7 unlicensed -- Okay. Thank you.

8 MEMBER COOPER: Can I interrupt
9 for a second?

10 CHAIR TRAMONT: Absolutely Mike.

11 MEMBER COOPER: When you blend Two
12 into One you're still going to retain the
13 concept of the national spectrum technology
14 road map?

15 MEMBER SALEMME: I think the road
16 map is on the side of the road, from what I
17 could tell.

18 MEMBER COOPER: I'm sorry. Say
19 that again.

20 (Simultaneous speaking.)

21 MEMBER WARREN: No, not formally
22 so titled.

1 MEMBER SALEMME: Marty, but we
2 should work on making sure that we get the
3 right concept without the technology road map
4 and --

5 CHAIR TRAMONT: Okay. Is there
6 anything else -- are there any other concerns
7 about either how Gerry summarized, or any
8 other things related to this report or can we
9 move forward to vote?

10 MEMBER COOPER: I don't have
11 anything else.

12 CHAIR TRAMONT: Harold.

13 MEMBER FURCHTGOTT-ROTH: Just
14 processwise, Gerry, I hope you'll be able to
15 enlist support, for example, from Karl, Greg,
16 on just some of the language issues to be sure
17 that that's all --

18 MEMBER SALEMME: I look forward to
19 it. As long as everyone is -- you know, moves
20 quickly, we can do it.

21 CHAIR TRAMONT: So, we are going
22 to adopt these editorial privileges there will

1 be a recirculated item tomorrow. It does not
2 require -- it is a raise-the-concern
3 circulation.

4 It is not an everyone-has-to-vote
5 circulation, because -- so, if it is
6 inconsistent with what we have adopted then
7 you raise the issue, but otherwise we do not
8 need affirmative acquiescence from each
9 person.

10 So, all those in favor of the
11 report, as amended, with editorial privilege,
12 signify by saying "Aye."

13 (Chorus of Ayes.)

14 CHAIR TRAMONT: Opposed?

15 (No response.)

16 CHAIR TRAMONT: Okay. The report
17 is adopted. Congratulations, Gerry.

18 MEMBER SALEMME: The Subcommittee,
19 we should name them all, so we all get credit.

20 CHAIR TRAMONT: For your yeoman's
21 effort. All right. With that, I now turn it
22 over to Assistant Secretary Strickling.

1 MR. STRICKLING: Thank you, Bryan.

2 I do want to spend the bulk of my
3 minutes talking about where we want to go with
4 the Committee, and Karl will be discussing
5 things as well in terms of what we're
6 currently doing in NTIA and how we'd like to
7 use the committee going forward.

8 But, before I get to that, I think
9 I'd like to take just a minute to celebrate a
10 little bit of the past work of the Committee
11 that's wrapping up today. And so, first, for
12 several years we've had a designated Federal
13 Official, Joe Gattuso, from our office of
14 policy, and I don't see Joe in the room.

15 (Simultaneous speaking.)

16 MR. STRICKLING: And, as Phil
17 mentioned, we've -- this Committee has been
18 led so ably the last few years by Bryan and
19 Dale. Both of them have requested that they
20 not be considered as Co-Chairs going forward,
21 although we do hope to convince both of them
22 to continue on as members of the Committee.

1 But, just in recognition of their
2 leadership for the last couple of years, we'd
3 like to recognize both Dale and Bryan with a
4 Certificate of Appreciation.

5 Stand up, gentlemen.

6 (Applause.)

7 CHAIR TRAMONT: Thank you very
8 much.

9 MR. STRICKLING: They've obviously
10 set the bar quite high in terms of the
11 leadership of this or any advisory committee,
12 and hopefully, have set a standard for their
13 successors to emulate going forward.

14 So, with that, I'd like to then
15 turn to where we're headed with things.

16 As I mentioned, we have decided to
17 re-charter the Committee. We have actually
18 had put out a notice requesting people to re-
19 nominate themselves, nominate themselves or
20 submit nominations.

21 The deadline for submitting that
22 information I think originally expired

1 yesterday, but we have extended it through the
2 end of January.

3 One thing we decided to do was to
4 have all members of the Committee whose terms
5 are expiring now -- and I think we had one
6 person whose term was expiring midyear, to go
7 ahead and reapply.

8 In other words, if you want to
9 continue on, if your term is expired, we do
10 need you to reapply at this point in time.

11 When Joe gets back, if you have
12 any questions as to whether you're in that
13 category or if you have any questions as to
14 what -- what is needed, feel free to catch up
15 with Joe.

16 In fact, there's Joe. Joe, come
17 on down for a second. We had a Certificate of
18 Appreciation to recognize your work as
19 Designated Federal Official because Joe will
20 be taking on new and additional duties going
21 forward, and so we wanted to thank you with a
22 certificate.

1 MR. GATTUSO: Thank you, sir.

2 (Applause.)

3 MR. GATTUSO: It's been good
4 working with you. Nice to get to know all of
5 you.

6 MR. STRICKLING: And so, again,
7 putting him back to work now, if you have
8 questions about whether you need to reapply,
9 he has all that information and he can give
10 you the information on things.

11 I'm going to let Karl talk about
12 the specifics of what we want to do with this
13 group going forward, but you've heard Phil
14 give his thoughts.

15 And all of this comes under the
16 rubric of supporting what is going to be a
17 primary work effort of NTIA over the next two
18 years to find the 500 megahertz of spectrum to
19 be allocated to commercial broadband use as
20 directed by the President last summer.

21 So, we want to take this Committee
22 and turn it into a support group to help us

1 conduct that effort. We want to do it in a
2 way that's respectful of the missions that are
3 being currently performed by federal agencies.

4 We need to protect those missions,
5 but at the same time, we and the agencies,
6 themselves, understand the compelling need we
7 have to find this additional spectrum.

8 And so, we see this as being -- as
9 presenting a variety of technical questions,
10 perhaps business questions, probably less so
11 lobbying issues, but -- and I think that
12 should be reflected in the membership of the
13 Committee.

14 So, our call for nominations made
15 a very specific request to attract more people
16 with technical and engineering backgrounds who
17 could assist this group. And again, to the
18 extent that you are aware of people out there
19 who fit that, we would definitely like to
20 encourage those folks to apply.

21 And if you have suggestions in
22 that regard of people that you'd like us to

1 reach out to and try to recruit, we're happy
2 to do that. But, just understand, we only
3 have basically 20 days to do that work, but
4 we're happy to reach out to folks if people
5 have suggestions.

6 I'm even willing to go to the ends
7 of the earth to find new members of this
8 Committee. I happen to be in Patagonia over
9 the holidays and I ran into some -- a person
10 you all may know, Professor Andrea Goldsmith
11 from Stanford who, I guess is -- I did not
12 know her, but she's an expert on spectrum
13 sharing and engineering and such like that
14 and, in fairness, she didn't know me, either,
15 so it doesn't really matter, but there we
16 were, you know, among 60 people at literally
17 the end of the earth, and I was trying to
18 recruit her to join the Committee, and we're
19 going to enlist Greg to continue to twist her
20 arm out at Stanford.

21 So, one of the things I did,
22 before I turn it over to Karl, I did want to

1 react and respond to the exercise that we
2 performed last month -- or last meeting, where
3 we -- where you all gave us ideas for how we
4 go about with the process of this Committee
5 going forward.

6 We've looked at the list. I think
7 we want to adopt many of the recommendations
8 that we heard that day. I think just grouping
9 them in terms of some of the categories, one
10 of the things that we heard was the actual
11 conduct of the meetings themselves.

12 There were recommendations that we
13 have longer meetings, not just to have longer
14 meetings, but to provide opportunities for
15 more expert panels, which we think is a good
16 idea, the opportunity to provide work time for
17 Subcommittees, perhaps in the afternoon at the
18 end of a main session, more opportunity for
19 full Committee discussion of issues which I've
20 been glad to see here in the last two meetings
21 we've had good discussions with everybody
22 around the table.

1 And I think that's important. I
2 mean, the Subcommittees have to take the work
3 to a certain point of having a draft for
4 people to react to, but I think it's important
5 to have these opportunities for the full
6 Committee to sit and deliberate on the
7 concepts we're talking about.

8 Unfortunately, we get into the
9 rush at the end and they turn into
10 wordsmithing exercises, but we need to find a
11 way to have broader discussions on the
12 policies people are talking about in the
13 Subcommittees, and we will endeavor to do
14 that.

15 And then, I think the other thing
16 that we heard that, you know, I think you
17 heard Karl doing this today, is providing more
18 staff reaction to what we're hearing. I think
19 that's an important piece of this, and I think
20 having that feedback loop from Karl and his
21 staff on the work is an important piece of
22 this.

1 So, as we go forward, we will --
2 we will try to design meetings and work with
3 the as-yet-unidentified and undesignated Co-
4 Chairs to come up with meeting plans that
5 reflect that.

6 And then I think we also want to
7 focus on some of the overall working methods.
8 There was some ideas of having some specific
9 rules of engagement with respect to quorums
10 and timeliness and how we account for dissent,
11 I think we will talk about those, in trying to
12 provide as much advance knowledge, both of
13 scheduling as well as of the idea of having
14 outlines of reports circulated and having
15 discussions around those -- the concepts
16 before perhaps some of these things get
17 committed to writing.

18 All good ideas, and we will
19 endeavor to include those in the structure of
20 these meetings going forward.

21 So -- and then, I don't mean to
22 not cover every idea, there were some

1 substantive suggestions as well, but I think
2 that probably needs to wait for the first work
3 session of the new Committee, which we're
4 hoping we can do because what we have to do
5 before the next meeting is, we have to
6 recharter, which I think the existing charter
7 expires in April, so we are starting the
8 process now to get the new charter done.

9 That is, hopefully, largely a
10 ministerial exercise. And then, secondly,
11 which takes longer, is to get the new members
12 appointed and all of you will recall, going
13 through the -- the review you have to go
14 through as a special government employee, and
15 that does take a certain amount of time.

16 But we're still thinking,
17 hopefully, in the April time frame we might be
18 able to get the next meeting scheduled, and
19 then that's what we're shooting for. If we
20 have to slip that a few weeks, bear with us,
21 but we'll try to move with all dispatch to get
22 the new Committee organized and through all of

1 the legal process that we have to go through.

2 So, in addition to what you heard
3 from Phil, some big concepts, I've also asked
4 Karl to think about what particularly would be
5 of help to him as we go forward in terms of
6 the current work that we're engaged in, and
7 I'll turn it over to Karl to give people his
8 thoughts on that.

9 Yes.

10 MEMBER REASER: I just have one
11 question. Those who are interested in
12 continuing, can we turn the OG-50's in now,
13 because that wasn't early on -- I didn't see
14 that on the list.

15 MR. GATTUSO: For those of you who
16 are continuing and --

17 MEMBER REASER: Is that an annual
18 requirement or --

19 MR. GATTUSO: It is an annual
20 requirement. It's a calendar year
21 requirement. The -- it's run by the General
22 Counsel's Office and in the past I've asked

1 them and they said wait for us to tell you.

2 MEMBER REASER: Okay.

3 MR. GATTUSO: And if the remaining
4 set of members want to move forward, I can
5 approach them and ask that they start it, but
6 I do know that the next meeting will not take
7 place until everybody, including the new
8 members, file theirs. So you can wait and do
9 it with everybody else, or you can do it early
10 then.

11 MEMBER REASER: Okay. That just
12 takes a while to fill out. I would recommend
13 you just do it now. That would be my
14 recommendation.

15 MR. STRICKLING: I mean, we do,
16 all of us, want to go through the process of
17 considering all the applications that come in,
18 and so while those of you who are current
19 members of the Committee, certainly have
20 strong qualifications for reappointment.

21 I don't think people should
22 automatically assume we'll be able to

1 accommodate everybody on a reappointment so,
2 in light of that, you may want to wait until
3 we at least have a chance to review the
4 applications and get back to people on that.

5 MR. GATTUSO: And, Larry, while
6 I'm standing, as Kevin was asking the question
7 about what you need to do, I strongly
8 encourage you to check the Federal Register
9 Notice which is posted on the website.

10 The bottom line is, you're asked
11 for a resume or a CV and a statement of
12 qualifications to address how you're
13 qualified, the balance, whatever factors you
14 bring to the Committee.

15 But the requirements, themselves,
16 including the date and our new register
17 notice, reopening the date till the 31st of
18 January is online.

19 MR. STRICKLING: Okay. Bob.

20 MR. NEBBIA: Okay. In case you
21 hadn't noticed, it was actually scheduled at
22 10:15 this morning.

1 So, anyway, I wanted to quickly
2 bring you up to date on where we are on our
3 spectrum search, and then link that into the
4 discussion of what we think we need to look at
5 in the future.

6 First of all, in accordance with
7 our plan, our 10-year plan, we began our
8 prioritization process back in October, and
9 since we chose to ultimately set out a list of
10 priorities, and then to review those bands in
11 series the whole issue of which do we do
12 first, and so on, became very important,
13 because the later on in the process you are,
14 then the tougher it gets to be that, as we get
15 onto that band that it's actually going to be
16 completed in ten years.

17 So, the bands we look at early.
18 It's important that we be -- that they be of
19 interest to people and that ultimately they
20 offer some significant possibilities.

21 We don't want to spend a year on a
22 band in the beginning that we feel like in the

1 end doesn't yield something.

2 So, the prioritization process is
3 very important. We're finding it very
4 challenging as we want to review these bands
5 that are both of interest to the wireless
6 industry and yet, at the same time, cull these
7 potential results.

8 So, with respect to identifying
9 the interest to the industry, we're looking
10 primarily at where they are on the -- in the
11 frequency spectrum, and the issues related to
12 things like international harmonization, which
13 are of interest to them in producing
14 equipment.

15 Obviously, things that are way
16 down on the spectrum are lower, probably are
17 less interest, or very high in the spectrum on
18 our list of bands that we have are probably of
19 less interest.

20 We're also looking at the aspect
21 of how much spectrum is available in a
22 particular band, and we're trying to identify,

1 well, what would be the key factor, and at
2 least for many it seems like looking at LTD,
3 the 20 megahertz, becomes a key factor, so you
4 may say that if we're looking at reallocation
5 and then relocation of Federal operations,
6 we're looking at bands that have 20 megahertz
7 at least available to them. On a lesser
8 extent, 10 megahertz, the 20 and below 10 and
9 so on.

10 And that's a key issue, and that
11 is a difficult choice, because there, in fact,
12 are some groups that say, I don't need 20
13 megahertz, and yet, if we're going to start
14 prioritizing of bands we have to identify what
15 that -- kind of what that break point is.

16 So, we are analyzing the bands
17 kind of on that basis and then also, as we
18 look at this and we try to judge where is the
19 interest of the industry, it's also important
20 to understand where they are able to go in the
21 spectrum and, certainly, our recent discussion
22 has been 1755 to 1780, and when we talk about,

1 well, you wanted 1300 megahertz or 800
2 megahertz or 500 megahertz, that's only 25.
3 What else do you want?

4 They say 1755 to 1780, 1755 to
5 1780, and we keep getting back to this, okay.
6 Is there a larger plan here that we're able to
7 work, because that's -- 25 megahertz may suit
8 some goal, but they don't suit the whole
9 picture?

10 Also, if we find bands that have
11 20 megahertz available to them, that only
12 meets one user's need, and even in --
13 depending on what technology that you select,
14 it probably only meets one half of one user's
15 need, because they are looking for another
16 band to match it with.

17 So, these are -- these are all the
18 issues, I think, that go into us trying to
19 judge which bands, from an industry interest
20 standpoint that we looked at first and then,
21 as we looked from the standpoint of whether
22 it's possible, or they -- they represent a

1 significant possibility to move forward, we
2 have to look at things like in terms of cost,
3 spectrum available to move the current users
4 out, whether there's technology available, and
5 then these international hurdles that we may
6 have to get across.

7 And last, the kind of transition
8 times involved. We know if we're dealing with
9 some of the geosatellites we may be dealing
10 with transition times on the order of 20
11 years, not -- not the 10-year plan.

12 So, those things are significant,
13 I think, laying out the order. Then we've
14 also looked at the fact that the break between
15 relocation and opening the door for exclusive
16 use possibilities, and sharing on the other
17 side are not totally clear, and we may end up
18 with bands that are still partially shared,
19 and other bands where there's a much more
20 significant technical solution on the sharing
21 side.

22 So, all these are obviously making

1 our choices difficult as we lay out that plan.
2 But, nonetheless, at the end of this month we
3 will have identified at least the first band
4 that we're going to get into in-depth.

5 We're going to begin to lay out a
6 list of priorities that may merge those that
7 can involve relocation with those that share,
8 so the second band we may look at -- it might
9 be a band we're looking at sharing, not
10 relocation.

11 So, these are all the things we're
12 trying to deal with. So, as we look forward,
13 I believe a key component of what we've got to
14 do here, since this is so central to what
15 we're doing now, is enlisting the Committee
16 support to help us through many of the issues
17 that are going to come up along the way.

18 And some of these are going to be
19 things like -- we may get some additional
20 input, might be useful in helping us if there
21 are other bands that we've not put on the
22 table that, for some reason, you think there

1 is a good opportunity.

2 Now, I know I've gone through the
3 bands, so if you come up with one we'll
4 probably have a long, hard talk about it to
5 try to understand why you think it is
6 possible.

7 But also, we're going to need to
8 look at approaches to sharing around things
9 that have long-term embedded infrastructure,
10 and whether that's a possibility.

11 Once again, we talk about
12 satellite/earth stations that are talking with
13 a satellite that's scheduled to be up there
14 for 20 years, how do we work around that kind
15 of embedded fixed infrastructure, and does
16 that offer us some opportunities.

17 Are we willing, in reality, to
18 live with temporal interference into the
19 current new generation of wireless systems
20 where, yes, if you take a few channels that
21 get knocked out at specific times, because the
22 emphasis in talking about the spectrum used by

1 the government is that we don't use it that
2 often. We don't use it that intensely.

3 So, the question comes up, as we
4 look forward, is industry willing to move into
5 bands where they may get interfered with once
6 in a while, and that becomes the sharing
7 arrangement.

8 Because, I know, every time I pick
9 up my phone I have no idea whether the initial
10 channel my phone wanted to go on was being
11 used, was being blocked, and it rotates over
12 to another channel.

13 So, I think we need, in looking
14 for a long-term construct here, to ask
15 ourselves those hard questions; are we willing
16 to live in the wireless broad band environment
17 with that type of interaction between
18 government and non-government systems.

19 We also, I think, need to ask
20 ourselves the question, as we look for more
21 spectrum, is it more spectrum in certain
22 geographic areas where maybe we can open up

1 the door to the government to keep operating
2 in other areas that were -- you know, if we
3 can get New York and Philadelphia and Miami,
4 Los Angeles, San Francisco available, can we
5 still do stuff in other parts of the country
6 because the spectrum demand has still not
7 risen anywhere, you know, near that. That's
8 uncertain.

9 So, I think we need to look at
10 those kinds of, you know, geographic aspects
11 and then, as we start discussing technical
12 sharing means, I do think we have to ask
13 ourselves the question, is the wireless
14 industry willing to get into a technical-based
15 sharing future where the bands are, in fact,
16 shared and there's technical mechanisms that
17 in some cases we've discussed for unlicensed
18 uses, but is the licensed community willing to
19 get access to a band where, in fact, on some
20 of their channels they'll be turning off in
21 response to other activities that are going
22 on, or is it, no, it's either my exclusive

1 spectrum or nothing.

2 So, I think we need to look at
3 technical sharing. Certainly, we need to
4 continue, I think, on the unlicensed side and
5 any type of shared environment side to look at
6 the enforcement and the rule construction that
7 we started talking about in terms of
8 unlicensed here and those types of mechanisms.

9 So these are all things, as we
10 move forward, and even as we may identify,
11 here's our first band we're going to look at,
12 we may actually ask you for help.

13 Okay. There are satellite systems
14 in this band. How can we propose a long-term
15 way of working around them, and are we looking
16 for those kind of inputs. That's why this
17 little bit more emphasis may be on some of the
18 technical aspects.

19 Certainly, we're going to want to
20 hear from industry needs and so on, and the
21 realities of industry, and for that reason the
22 last thing I want to raise here, I think is

1 getting input on the approaches that we can
2 take to do the outreach that Phil was talking
3 about because, at least my own experience has
4 been, over the few years I've been doing this
5 is that trying to reach detailed decisions and
6 technical sharing arrangements via public
7 notices, NPRN's and so on, where everybody
8 just shoots back the latest, you know, kind of
9 position on it and says, no on my side, and
10 yes on the other side.

11 Somehow we have to be able to
12 create an open but interactive process where
13 people can really dialogue back and forth the
14 say way even the dialogue today is getting the
15 answers on those reports, I'll tell you, it's
16 really hard following all the interaction when
17 it was all done by, you know, emails from
18 people and certainly it's hard if it's only
19 done through -- we put out an NPRM, we ask for
20 formal comments, we respond to those.

21 And so, you've got to come up with
22 some means of having that interactive dialogue

1 to come up with real solutions.

2 So, I think we'll be looking for
3 your, you know, input on how we can create
4 that and what kind of outreach we need to do
5 and so on.

6 CHAIR TRAMONT: Any questions for
7 Karl or Larry?

8 Janice.

9 MEMBER OBUCHOWSKI: It's not
10 really a question. It's a suggestion. That
11 was an outstanding overview. In terms of
12 process, whomever's going to be around this
13 table should be scared from day one by that
14 set of questions and whatever else Larry and
15 the team here derive, because we're all
16 capable of debating a lot of issues that
17 really won't solve the problems that you need
18 to solve.

19 So, another suggestion which goes
20 to the process point is, it's probably
21 important to be pretty dictatorial with
22 committee chairs.

1 It becomes really, really hard,
2 and we're all guilty of it, to, you know, kind
3 of work out the details in the last month. At
4 that point the flurry of emails just becomes
5 overwhelming.

6 CHAIR TRAMONT: Gary.

7 MEMBER EPSTEIN: I, of course,
8 agree with Janice. I think I've expressed
9 this before, and I think one of the key things
10 would be early consultation with staff so the
11 committees who are really doing their absolute
12 best to try to define the questions and issues
13 that are here and putting a lot of time and
14 effort into it so we don't go down to blind
15 alleys and come up with answers which are not
16 really helpful.

17 I think that really would be
18 important on a long-term basis.

19 MEMBER SALEMME: If I could add
20 onto that, I think, when the scope of work
21 first comes out, more attention has to be paid
22 to that, because that really is what's going

1 to drive the activity in the first two months
2 by the working groups.

3 And I think if the full committee
4 really says we're going to look at the scope
5 of work, we're going to get the details around
6 that, this is the assignment, I think it's
7 easier for everybody to then stay on track.

8 CHAIR TRAMONT: All right. I
9 think early focus on the scope of work is
10 important and early drafts, right?

11 MEMBER SALEMME: Right. Yes.

12 CHAIR TRAMONT: The early drafts
13 that were circulated, and I think that's
14 really sort of a more continuous work --

15 MEMBER CRAWFORD: I just want to
16 underscore the request for technical and
17 engineering just now. I hate to use ICANN as
18 a model for anything, but there is a Security
19 and Stability Advisory Committee, to ICANN
20 which is made up only of actual engineers
21 chaired by Steve Crocker for years now, and
22 they give real advice and it's detailed and

1 they have this interactive relationship.

2 If this Committee could be more
3 like that, I think it would be very helpful.
4 So, the company representatives, if you could
5 dig down in your ranks and find people who
6 would have the time to show up and help Karl
7 and Larry on some more detailed questions, I
8 think that would be very helpful.

9 MEMBER FONTES: I think, Karl, one
10 of the important things, and Larry, in this
11 process which I think will help, the initial
12 committee work is to focus the questions
13 because, you know, the scope -- you know,
14 everybody would like to keep the scope as
15 convenient to their issue as they would like
16 to keep it.

17 And I think if you narrow the
18 scope and focus on the questions and have the
19 steering groups and the committees address the
20 questions, then I think that it will be much
21 more tailored than, even with that, they're
22 going to get creep, mission creep, but I think

1 the focus and the specificity of the questions
2 is critically important.

3 CHAIR HATFIELD: As one of my
4 early professor says, a well-defined problem
5 is half-solved, and I think that -- I think
6 there's an element of truth of that.

7 The only flip side I would be
8 cautious, I think it's very important that
9 NTIA play a very big role in defining the
10 problem.

11 I get a little bit concerned that,
12 if we're not careful, we might become an
13 extension of NTIA and reflecting what the
14 answers they want to hear, and I think we need
15 to maintain out independence and impartiality.

16 So, there is a balance there
17 between having them help us really understand
18 the problem and then figuring out what the
19 solution that we and our best objective,
20 professional interest can provide.

21 MEMBER CALABRESE: Along those --
22 along those same lines, I was thinking of

1 bringing a similar point, is that I would urge
2 you to -- you know, not only -- I guess,
3 right, be specific about what you need, but
4 then also to -- and I don't know whether this
5 would be at the first meeting when we
6 reconvene or maybe between now and then, but
7 solicit ideas and discussion about what
8 topics, because I think one of the benefits of
9 CSMAC that, you know, I would not want to
10 lose, is that, you know, is that we could
11 introduce, you know, some issues or aspects of
12 this that maybe you're not already planning on
13 or thinking about.

14 CHAIR TRAMONT: Any other points?
15 Anyone on the phone have any
16 feedback?

17 MEMBER REASER: I would just say I
18 would I would throw schedule in addition into
19 that, we need to -- can get the scope of work,
20 sent a real schedule that we try to hold to
21 because --

22 CHAIR HATFIELD: Good luck with

1 that.

2 CHAIR TRAMONT: Yes. You've got
3 to have some stars as a result of that
4 process.

5 Yes. Good point. Well-taken.

6 MEMBER COOPER: Bryan.

7 CHAIR TRAMONT: Yes.

8 MEMBER COOPER: I agree with a lot
9 of comments that are the more specific, the
10 more specificity we can receive from NTIA
11 staff, I think that helps -- is really
12 helpful, and I think the experience, at least,
13 perhaps at moments where time's an issue, the
14 committees that do a lot of work, and not
15 necessarily called at the eleventh hour, but
16 near the end we would get further guidance
17 that would have to, you know, regroup, so it's
18 a lot of work.

19 So, the more specificity we get
20 earlier on, it helps productivity in the -- in
21 the reports. Thank you.

22 CHAIR TRAMONT: Thanks, Marty.

1 Anything else?

2 (No response.)

3 CHAIR TRAMONT: Thank you. So,
4 with that, I believe that concludes our formal
5 program. Now the opportunities for public
6 comment. Does anyone -- yes, sir.

7 Why don't you stand up and
8 identify yourself. I don't know, for
9 microphone purposes, maybe you could come up
10 to the -- is this mic live?

11 MR. MARK MacCARTHY: Right here at
12 the table.

13 CHAIR TRAMONT: You're at a table
14 spot. Okay.

15 (Off-record discussion.)

16 MR. MacCARTHY: So, I'm Mike
17 MacCarthy. I'm at Georgetown right now, and
18 it's good to see some familiar your faces,
19 but Dale and I were at a conference at the
20 Aspen Institute back in November there, Aspen
21 Institute Spectrum Conference, and Shelly
22 Firestone asked me to come in and, for the

1 second year in a row, sort of summarize the
2 results of the conference.

3 I want to take just a minute to
4 give you a sense of what the conference came
5 up with to help the committee figure out
6 whether it's of use to them and provide that
7 information in sort of an advanced way to give
8 to NTIA.

9 The group really focused on what I
10 think is a strategic opportunity for some
11 pretty long-term improvements in spectrum
12 management, and I know there's a big push to
13 do 500 megahertz for a wireless broadband, and
14 that was the context of the discussion, but
15 the real discussion was how do we make longer-
16 term institutional changes in the process
17 whereby spectrum is managed.

18 And for that purpose, the group
19 really thought that some new legislation was
20 going to be required. On the non-governmental
21 commercial side the recommendation was for
22 legislation that embodied incentive auctions

1 on a voluntary basis.

2 There was some discussion about
3 whether or not that's all that was necessary,
4 and if you wanted to get something done in
5 Congress, maybe the best thing to do is just
6 to go narrow.

7 But at the end, the group said no,
8 we need to do some further improvements on the
9 government side, and for that purpose there
10 were really three items that they thought
11 would be important.

12 One, to develop the funding for
13 long-term strategic planning, not the sort of
14 short-term, day-to-day of acquisition of
15 spectrum for government purposes, but long-
16 term improvements in the Commercial Spectrum
17 Enhancement Act that have been talked about by
18 many in the Administration, and an innovation
19 fund to provide enough revenue to really do
20 some creative new thinking on ways to share
21 spectrum.

22 The groups thought that those kind

1 of proposals were a realistic opportunity for
2 the Congress to act. They did think that it
3 would have to be revenue-neutral, so that
4 there had to be a funding mechanism in the
5 current climate of budget control, you
6 wouldn't have to have an opportunity for
7 creating further additions to the Federal
8 deficit.

9 And they're recommending that the
10 funding come from set-asides from the next
11 spectrum auction, if there are any device
12 certification fees, some portion of that be
13 devoted to these efforts.

14 And to the extent that there were
15 any spectrum fees, some portion of those
16 spectrum fees be devoted to this effort as
17 well.

18 By the way, the group did think
19 about spectrum fees as a possibility, and your
20 discussion today was reflective of the
21 discussion that we had in that group, so we
22 were unable to come to any consensus in that

1 area.

2 So, that's the report. The report
3 will be out in March or so, the next couple of
4 months, and I hope to get it around to all of
5 you for your consideration.

6 CHAIR TRAMONT: Thank you. Other
7 public comments?

8 MR. JIM SNYDER: So, it's been a
9 year since I first spoke to this committee
10 about its implementation.

11 CHAIR TRAMONT: State your name.

12 MR. SNYDER: It's Jim Snyder. It's
13 been a year since I first spoke to this
14 committee about its implementation of the
15 President's Open government Directive.

16 While I'll agree that there has
17 been some improvement, notably in the quality
18 of the Committee's meeting transcripts, there
19 are other areas that have either not improved
20 or gotten worse.

21 As of Sunday evening, January 9th,
22 2011, there were no posted meeting minutes,

1 transcript or video for the November 8th, 2010
2 meeting held more than two months ago, and
3 held prior to the last SMAC meeting held on
4 December 13th, 2010.

5 Ditto for the public meeting held
6 on December 13th, 2010. When I checked the
7 web page for SMAC yesterday afternoon and
8 after dinner, it was down.

9 Going back over meetings before
10 November 8th, video continues to be the
11 exception rather than the rule, even when it's
12 listed on the website and it appears to have
13 a link.

14 All too often, there continues to
15 be links nowhere on the website. Links to
16 nowhere on the website. For example, during
17 the week prior to the December 13th meeting,
18 the website had a link to the draft document
19 that would be discussed on December 13th, only
20 it didn't lead to the document.

21 Only the day before the meeting
22 did the link actually lead to the Incentives

1 Committee's draft report. This is incredibly
2 annoying for a member of the public who
3 expects links to either work or at least
4 generate an error.

5 As always, when meeting public
6 records are posted on the website, no date
7 next to the record indicating when it was
8 posted.

9 This is troublesome, not only
10 because of the lack of this type of behavior
11 encourages behavior in violation of government
12 Sunshine rules, but because members of the
13 public cannot use the pass to determine when
14 it is a good time to go to SMAC's website to
15 find document.

16 Lack of an email public meeting
17 notice system for interested members of the
18 public continues to be a problem.

19 For example, yesterday it was
20 worried that the forecasted snow today would
21 lead SMAC to cancel today's meeting. If
22 you're a SMAC member or a government employee,

1 you could be assured of at least getting an
2 email that a meeting has been cancelled, not
3 so a member of the public.

4 Over the years I've been to many
5 scheduled public meetings, cancelled at the
6 last minute for one reason or another. And
7 I've argued on multiple occasions to this
8 Committee without effect, it's very
9 inconsiderate when citizens cannot get the
10 same access to meeting notices and
11 cancellations as insiders.

12 But the main reason I wanted to
13 speak today is to update you on SMAC's
14 progress concerning it's Co-Chair's promise to
15 investigate the legality of posting online
16 SMAC statements of interest and credentials.

17 At the November 8th SMAC meeting I
18 described the problem SMAC has had with
19 inflated statements of qualifications and
20 asked the Co-Chairs to publish those
21 applications online on a going-forward basis.

22 They said they need to check the

1 legality of doing so and would get back to me.

2 As no one now disputes, there are mandates
3 that those applications must be public
4 information to keep the process honest,
5 otherwise, neither applicants nor those who
6 are responsible for selecting those applicants
7 will be publicly accountable.

8 Despite the fact that, to my
9 knowledge, no one now disputes that those
10 applications are public records, NTIA's
11 counsel has advised SMAC staff not to publish
12 them by asserting that it would be illegal to
13 do so.

14 At the same time, SMAC staff says
15 it is unable to cite the specific laws that
16 says it would be illegal to do so.

17 I now request that SMAC's Co-
18 Chairs either tell me under what law those
19 applications cannot be publicly posted, or
20 publicly commit that those getting the legal
21 citation from NTIA's counsel and getting back
22 to me with that information before SMAC's

1 meeting.

2 So, Dale and Bryan, will you
3 please cite the law the counsel used as the
4 basis for her opinion not to post that
5 information online, that public information
6 online as requested?

7 I have gone through a FOIA process
8 again, entered that nightmare process, but
9 tell me what the citation is -- I mean, if
10 you're going to reject something, I think it's
11 reasonable to cite specifically what the law
12 is on which you are basing the rejection.

13 CHAIR TRAMONT: I think you are
14 well-aware that the Chairs are not exercising
15 independent legal judgment about the process
16 moving forward on these issues, so we defer to
17 NTIA staff on the legalities, and we have
18 tried to work constructively with them to
19 respond to the transparency concerns that
20 you've raised --

21 MR. SNYDER: But you're not --

22 CHAIR TRAMONT: -- which we'll

1 will continue to do so.

2 I appreciate your acknowledging
3 that there have been some improvements. We
4 continue to try to make good on the promises
5 of the Administration to make sure this
6 process is more transparent, and we'll
7 continue to do so.

8 And I know that everyone at NTIA
9 is committed to that principle.

10 MR. SNYDER: Then, last -- my last
11 point here, I've also requested CSMAC's Co-
12 Chair's commitment to upholding the FOIA laws.

13 NTIA has had a long track record
14 of ignoring and otherwise abusing the FOIA
15 laws, in clear contradiction to Larry
16 Strickling's commitment to openness in the
17 spirit of the President's Open Government
18 Directive.

19 I could give you many examples and
20 would be happy to after this meeting, but I
21 lack time to do so now. My simple question to
22 you, then, is: Do you believe those laws

1 should be upheld, the FOIA laws? Do you
2 believe in those laws?

3 Many agency personnel don't, and
4 that's why we get into these problems. But
5 I'm asking you, both of you personally: Do
6 you believe those laws should be upheld or
7 not?

8 CHAIR TRAMONT: We appreciate your
9 public input. I think the process today and
10 to date has demonstrated our commitment to
11 being transparent in how we deliberate, and
12 how we adopt reports.

13 MR. SNYDER: Absolutely not. I
14 have a long track of FOIA requests that have
15 gone unfulfilled, and I've had to go to a --

16 CHAIR TRAMONT: Right. All I'm
17 suggesting is our meetings themselves, and our
18 process we have tried to make as open as we
19 possibly can within the confines of the legal
20 structure.

21 You know, I'm not aware of what --
22 I've not read the ruling on your FOIA request.

1 We do appreciate your continued participation
2 in the process and to help ensure that we
3 continue to improve and call these things to
4 our attention when there have been -- when
5 there have been errors.

6 So, we appreciate your help and
7 participation, and we appreciate your
8 attendance.

9 MR. SNYDER: Would you then be
10 willing to disclose on CSMAC's websites
11 violations of those laws as they relate to
12 FOIA requests of CSMAC public documents?

13 MEMBER CRAWFORD: I think Bryan's
14 responded to the best of his ability at this
15 point. I want to support the first half of
16 your comments about the -- the postings on the
17 website and how things are made available
18 publicly, and that is embarrassing and I hope
19 that that will be corrected in the next
20 session of CSMAC.

21 CHAIR TRAMONT: Okay. Thank you.
22 Any other public comments?

1 (No response.)

2 CHAIR TRAMONT: With that, I
3 apologize. Dale had another appointment that
4 required him to leave a little bit early
5 today, but on behalf of both of us, I want to
6 thank everyone for their service. It has been
7 a tremendous honor to serve with you over the
8 course of the last four years, many of you
9 have been here up to four years.

10 And I think we have done some
11 great -- some excellent work and I appreciate
12 the confidence that Larry and Meredith before
13 him have shown in us and in this process, so
14 we appreciate the opportunity to serve and to
15 work with all of you and learned so much from
16 each other during the course of this process.

17 So, thank you all very much, and
18 we look forward to seeing you at these debates
19 and wars to be continued. Take care.

20 (Applause.)

21 (Whereupon, the above-entitled
22 matter went off the record at 12:24 p.m.)

A				
ability 24:13 46:10 60:19 88:4 150:18 152:15,18,21 215:14	acronym 125:11	adjourned 161:17	116:18 118:10	amazingly 8:21
able 111:11 123:19 127:22 170:14 181:18 183:22 187:20 188:6 195:11	act 120:5 205:17 206:2	Adjunct 1:16	137:20 176:3,5	amended 61:10 83:7 171:11
ably 172:18	action 43:10	Adler 1:18 6:12,12	agency 13:5 39:9 128:2 214:3	amendment 39:2 69:10 132:8
above-entitled 161:11 216:21	actionable 19:13 19:19 20:5	Administration 3:12,14 26:18 36:4,7,8,15 111:1 124:1,19 133:7 205:18 213:5	agency's 114:10	AMERICA 1:1
absence 84:7	actions 28:10 36:6	Administration's 123:1	AGENDA 3:1	American 1:21 4:22
absolute 27:17 197:11	active 115:10	Administrator 3:15	aggressive 64:1 79:21	amount 13:22 17:13 36:21 63:6 181:15
absolutely 88:12,17 126:6 147:2 169:10 214:13	activities 3:13,14 64:12 111:1 193:21	admit 108:12	ago 152:11 208:2	amounted 14:1
abusing 213:14	activity 64:16 155:10 198:1	adopt 142:8 170:22 178:7 214:12	agree 17:1 19:7 26:16 27:19,19 29:10 39:5 50:15 86:14 88:12,18 105:13 152:16 197:8 202:8 207:16	amounts 18:19
access 87:15 102:21 104:2 106:4,8,10 109:3 123:20 127:2 130:12 133:3 193:19 210:10	actors 57:11 58:5	adopted 61:17 162:8,10 171:6,17	agreed 30:13 40:4	amplifiers 148:11
accident 121:13	actual 11:14,15 26:12,14 29:2 137:9 138:9 178:10 198:20	adopting 58:9 61:10 162:13	agreement 22:4 24:21	analyses 113:20
accommodate 184:1	Adaptrum 2:10 6:15	adoption 9:16	agrees 19:16	analyzed 113:19
accommodates 16:19	add 30:9 39:6 66:10 79:3 136:2 163:9 197:19	advance 34:22 180:12	ahead 26:1 48:8 78:16 174:7	analyzes 88:3
account 19:21 28:1 39:20 49:12,18 55:18 180:10	added 13:15 51:5 55:22 68:2 163:22	advanced 2:13,22 204:7	Ain't 20:21	analyzing 187:16
accountability 11:10	adding 30:9 55:6 163:16	advances 64:11 136:17 139:15 143:19,21 163:13	AIP 10:19	Andrea 177:10
accountable 211:7	addition 11:7 55:15 70:17 133:1 182:2 201:18	advantage 113:11 118:11	air 120:20	and/or 153:18 167:11
accurate 17:4 68:11 69:9 151:3	additional 9:16 81:4 97:8,8 101:9 107:2 132:18 133:5,8,12 174:20 176:7 190:19	advice 198:22	Airborne 2:16	Angeles 193:4
accurately 69:3	address 56:3,4 82:9 82:14 104:14 105:18 133:13 136:7 144:6 184:12 199:19	advisability 10:9	aired 13:8	annoying 209:2
achieve 18:1 77:19 124:8	additions 206:7	advised 211:11	alarms 139:8	annual 182:17,19
achieved 75:14	addressed 50:4 62:20,22,22 63:13 83:15	advising 36:15	Alice 111:16	answer 47:21 48:19 84:18 105:16
acknowledging 213:2	addresses 152:5	Advisor 3:17	alleys 197:15	answers 119:5,6 195:15 197:15 200:14
acquiescence 171:8	adequate 70:1,3,20	advisory 1:5,12 4:8 7:15 36:2 173:11 198:19	Alliance 1:25	anybody 87:17 103:3 152:15 159:11 160:1,19
acquisition 205:14	Adjourn 3:24	advisory 1:5,12 4:8 7:15 36:2 173:11 198:19	allocate 41:7	anyone's 13:4
		Affairs 2:6,19	allocated 67:5 175:19	anyway 24:6 34:14 185:1
		affirmative 171:8	allocation 83:12 101:20 107:6 143:15 155:2	apart 8:17,22 21:19
		afraid 59:6	allocations 64:14 81:5	apologize 55:3 71:3 154:17 216:3
		afternoon 178:17 208:7	allow 12:13 104:8	apparent 95:12
		agencies 11:3,3 12:14 32:17 33:5 43:12,13 44:3,4 55:5 59:2 113:3,4 113:12 115:12	allowable 12:2	apparently 18:1
			allowances 101:10	appears 10:21 208:12
			allowed 64:12	appending 141:9
			alphabet 117:5	Applause 173:6 175:2 216:20
			alternative 18:18 52:5 56:18	applicants 211:5,6
			alternatives 113:14	applications 63:3

183:17 184:4 210:21 211:3,10 211:19 applies 46:5 apply 89:15 176:20 applying 100:5 appointed 181:12 appointment 216:3 appreciate 98:14 120:4 129:3,11 213:2 214:8 215:1 215:6,7 216:11,14 Appreciation 173:4 174:18 approach 17:18 64:9 65:2,7 85:7 96:21,22 99:10 162:12 183:5 approaches 24:14 25:4 100:14 191:8 195:1 appropriate 27:18 27:22 28:2 43:2 47:5 73:6 74:8,20 91:13 93:10 135:4 appropriately 65:2 162:4 165:12 appropriateness 49:11 55:17 87:8 appropriating 62:9 appropriation 49:21 appropriations 55:21 62:15 63:7 approval 3:8 8:10 approved 12:5 63:4 63:5 94:15 155:15 April 181:7,17 arbitrator 37:5 area 13:13 122:16 207:1 areas 67:19 118:19 119:21 192:22 193:2 207:19 arena 115:17 argue 152:18 argued 98:8 210:7	arguing 33:2 76:22 argument 20:10 arisen 145:18 147:7 148:20 166:8 arm 177:20 arose 84:14 arrangement 192:7 arrangements 195:6 ArrayComm 1:22 art 58:13 100:15 102:12 article 159:18 articulated 115:4 162:16 aside 167:21 asked 21:20 85:14 88:7 110:21 182:3 182:22 184:10 203:22 210:20 asking 118:2 134:13 160:5 184:6 214:5 aspect 20:12 54:9 84:10 100:2 186:20 aspects 99:20 193:10 194:18 201:11 Aspen 5:16 203:20 203:20 asserting 211:12 assertion 14:11,13 assertions 160:3 assessing 17:11 46:7 assign 78:4 assigned 17:10 45:14 56:15 57:1 58:2 59:20,21 64:16 153:7 assignment 106:3 120:22 198:6 assignments 64:14 assist 176:17 assistance 136:1	Assistant 3:5,21 7:8 171:22 associate 3:14 38:20 associated 12:15 13:7 association 2:4,6 5:9,13 assume 183:22 assumed 82:6 assumes 135:11 163:2 assuming 162:9 assumption 72:3 assure 111:17 assured 210:1 as-is 16:12 as-yet-unidentified 180:3 attached 90:14 attempt 50:3 73:22 136:8 attempts 50:2 attendance 215:8 attention 197:21 215:4 attract 176:15 AT&T 33:14 159:20 160:3,9 163:16,18 auction 114:17 206:11 auctioned 12:11 auctions 12:12 34:20 120:9 204:22 Audience 6:9 audits 122:22 authorize 165:11 authorized 101:20 103:20 automatically 59:7 183:22 available 13:11 17:22 73:9 77:10 186:21 187:7 188:11 189:3,4	193:4 215:17 Avenue 1:13 average 105:3 avoid 63:9 107:7 avoiding 49:15 aware 84:6 128:5 176:18 214:21 awareness 118:22 awkward 45:1 aye 61:11 171:12 Ayes 61:12 171:13 A-11 11:2,6,16 28:17 a.m 1:13 4:2 161:12,13 <hr/> B <hr/> B 113:22 118:18 back 8:5 9:19 16:4 20:11 37:16 40:19 42:4 51:6 59:18 60:16 69:15 71:13 76:22 82:8 99:12 99:13 101:3,13 103:22 104:8 107:17,18 108:3 109:18,21 110:15 111:13 114:17 129:19 154:5 158:10 161:2 174:11 175:7 184:4 185:8 188:5 195:8,13 203:20 208:9 211:1,21 backgrounds 176:16 bad 149:4,5 baggage 66:2 bake 113:20 119:11 balance 28:6 53:5 95:13 184:13 200:16 balanced 10:15 41:14 balances 72:5 band 12:8 51:7,15 51:21 52:1,4	89:13,14 92:3,3,5 104:2,4 106:10,13 116:7,19 121:3,10 126:20,22 127:1,2 127:14 130:22 148:10 152:8 154:21,21 155:1 155:12 156:9,10 156:13 185:15,22 186:22 188:16 190:3,8,9 192:16 193:19 194:11,14 bands 12:11,16 41:7 77:3 79:12 80:17 81:4,6,14 82:7 84:21 85:16 96:10 97:8 101:9 101:11 102:21 103:10,15 106:1,4 106:7,10 130:13 130:20 132:15,18 133:3 135:3,5 147:1 150:16 152:4 153:6,7,9 153:18,20 154:2,8 156:16,17 165:6 165:17,20 167:6 167:11,21 168:12 169:1 185:10,17 186:4,18 187:6,14 187:16 188:10,19 189:18,19 190:21 191:3 192:5 193:15 band-sharing 12:18 bar 173:10 Barker 1:18 4:20 based 18:10 63:11 86:5 88:8 132:8 basically 21:6 91:7 117:21 142:3,4 143:15 177:3 basing 212:12 basis 74:9 100:17 101:18 102:1,7 106:8 130:14,16
--	---	--	--	--

131:12 187:17 197:18 205:1 210:21 212:4 bear 181:20 beats 160:8 bed 114:9 125:2 beds 114:5 beefed 10:16 began 55:16 185:7 beginning 40:4 78:10 80:18 185:22 begs 159:21 begun 44:19 behalf 216:5 behavior 32:5,6 209:10,11 believe 7:21 10:12 21:20 22:4 25:20 26:4 28:4 45:12 62:21 83:19 160:2 190:13 203:4 213:22 214:2,6 believed 67:11 believes 18:17 74:2 benchmarks 137:19 138:10 beneficial 26:6 27:7 28:12 benefit 114:4 118:7 121:7,8 benefits 84:3 201:8 best 18:17 36:12 46:15,19 67:12 98:9 146:19 151:9 197:12 200:19 205:5 215:14 better 25:5 45:17 47:21 48:6 72:22 84:7 86:22 87:1 87:18 97:6 109:22 110:1,5 138:13 beyond 24:11 42:11 104:17 143:17 bias 67:4 big 118:18 182:3	200:9 204:12 bigger 154:12 biggest 83:7 Bill 111:21 119:4 bit 9:5 10:20 16:15 20:18 62:21 69:1 86:18 90:4,7 110:22 111:2 116:2 172:10 194:17 200:11 216:4 blanket 73:8 bleeds 83:8 blend 169:11 blind 197:14 blocked 192:11 blow 134:16 blue 114:2 Bob 27:11 29:8 48:8 50:13 57:20 69:12 70:19 97:18 107:10 108:17 110:15 163:22 164:1 184:19 Bob's 58:9 body 28:20 29:20 48:15 105:19 119:14 bold 159:9 bolded 164:21 bolts 84:19 Borth 5:1,1 109:19 133:19 bothering 56:19 bottom 143:15 164:2 184:10 bought 32:19 152:11 Boulder 128:3 bounded 165:10 box 92:11 brain 56:17 break 3:18 21:18 129:18 159:6 161:1 187:15 189:14 brevity 37:14 57:14	Brian 2:3 5:8 107:20 163:20 brief 7:12 38:1,12 48:13 111:2 briefly 38:20 107:11,14 bring 29:4 65:18 119:10 184:14 185:2 bringing 201:1 broad 86:4 87:15 111:12 114:5 116:7,19 118:9 121:10 126:20,22 127:1,2 192:16 broadband 86:7 175:19 204:13 broadcast 46:9 broadcaster 120:18 120:21 broadcasters 42:1 120:14 121:7 broadening 12:2 broader 12:14 46:11 85:3 88:19 179:11 broadly 121:18 brought 52:11 67:15 99:9 Bryan 1:13,17 3:4 4:11,17,19 8:6 39:5 52:20 172:1 172:18 173:3 202:6 212:2 Bryan's 215:13 bucks 92:4 budget 206:5 budgetary 113:21 budgets 13:3 build 44:20 114:9 116:12 135:22 Building 1:12 built 89:11 117:15 148:9 bulk 38:14 172:2 bullish 122:9 bunch 31:19	burdens 66:3 bureaucratic 117:5 burning 62:12 business 8:8 31:18 44:12 107:17 176:10 buy 32:15 33:6 42:7 91:20 <hr/> C <hr/> C 1:12,19 2:7 Calabrese 1:19 3:9 4:21,22 8:11,14 8:20 14:4 15:13 15:18 16:2,9 26:3 27:12 50:18 55:7 55:9 56:2,14 62:16,19 81:20 87:20 105:15 152:2 155:4 164:9 166:22 168:13 200:21 calendar 182:20 call 90:17 112:10 133:12 155:1 176:14 215:3 called 32:19 116:19 125:10 133:8 202:15 calling 136:12 calls 11:2 109:1 123:15 cancel 209:21 cancellations 210:11 cancelled 210:2,5 candidates 165:5 candidly 79:7 cap 135:8 capabilities 49:16 100:1 127:12 136:19 capability 40:6 114:20 127:6 128:16 capable 127:19 196:16	capacity 112:10 113:5 144:5 163:10 capital 11:5 Capitol 122:2 capture 38:2 52:10 65:15 74:17 78:21 82:12 136:13,19 137:16 138:3 162:4 captured 27:15 captures 136:3 care 69:16 216:19 careful 200:12 carefully 96:7 carrier 46:9 carry 120:21 case 73:2,10 101:16 184:20 cases 73:1 163:12 166:6,7 167:20 193:17 catalyze 112:13 121:18 catalyzing 115:8 cataracts 8:16 catch 174:14 categories 178:9 category 28:3 174:13 caucus 161:1 caution 126:11 cautious 200:8 caveated 86:11 caveats 74:17 celebrate 172:9 cellular 44:18 64:19 150:20 Center 117:8 central 190:14 certain 63:5 105:8 179:3 181:15 192:21 certainly 53:11 54:11 90:20 91:17 98:4 100:16 104:6 113:9 148:18
---	---	--	--	--

160:7,8 183:19 187:21 194:3,19 195:18 certificate 173:4 174:17,22 certification 68:16 68:18 69:22 70:2 70:5,6,13,21 93:8 165:9 206:12 certified 91:8 certify 90:16 cetera 125:3 CFO 39:8 CHAIR 4:3,6,19 6:10,16,17,20 7:1 7:4,6,7 8:7,15 13:18 14:2 16:6 17:20 18:6,9,20 19:3,6 20:6 21:18 22:3,8,11,13,17 22:19,22 23:7,11 23:18 25:20 26:15 29:7 30:4 33:15 33:22 35:20 37:10 38:18 39:17 40:11 42:9 44:7 45:2,6 46:22 47:10 48:7 48:20 52:12 53:1 54:15 55:8,11 56:20 57:19,22 59:1,10,12,15 60:1,6,10,13,15 60:18,22 61:13,16 63:14,17 66:14 67:20 70:18 71:2 71:6,14,16 78:15 79:10 80:6,12 81:1,13,19 82:17 83:1 86:17 87:1 89:21 92:15 94:20 97:17 107:8,14 108:2,17 110:14 119:17 122:20 124:9 126:17 128:18,22 129:3 129:10 131:21 132:2,7 133:21	134:2,10 137:8,12 140:14,17,21 142:1,10,14 143:3 145:6,14 146:11 146:14 147:5,10 147:14 148:2 149:8,12,17,21 150:2,8 151:12 152:7,13,20,22 153:2,12 154:3,7 156:1,19 157:1,4 159:5,11,14,16 160:11,18 161:9 161:14 163:15,21 164:2,14 165:21 169:4,10 170:5,12 170:21 171:14,16 171:20 173:7 196:6 197:6 198:8 198:12 200:3 201:14,22 202:2,7 202:22 203:3,13 207:6,11 212:13 212:22 214:8,16 215:21 216:2 chaired 198:21 Chairman 1:21 42:20 chairs 180:4 196:22 211:18 212:14 Chair's 213:12 challenge 54:7 75:12 103:3 112:4 126:13 127:13 144:11,13 164:20 166:4 challenges 104:6 112:3 113:1 challenging 186:4 chance 47:11 62:11 114:1 129:22 184:3 change 16:14 17:13 17:17 32:6 35:1,4 35:14,18 45:7 46:11 51:20 55:1	55:14 56:3 81:11 106:13 107:6 141:17 142:9 160:5 161:3 163:7 167:10 changed 54:21 96:3 101:2 102:17 changes 9:8,16 54:16 55:2 161:18 166:19 204:16 changing 21:2,3 22:5 75:3 channel 106:19,20 120:19 192:10,12 channels 106:18 191:20 193:20 characteristics 49:17 68:17 85:20 characterization 68:12 characterize 25:21 96:20 characterized 68:22 characterizing 28:18 charge 97:2 charter 79:15 181:6,8 check 90:21 184:8 210:22 checked 208:6 checklist 11:17 Chief 1:24 2:3 choice 45:18 61:6 145:3 149:16 187:11 choices 190:1 choose 48:18 Chorus 61:12 171:13 chose 185:9 chuckle 160:21 CIO 117:22 Circular 11:2,16 28:17 circulated 180:14	198:13 circulation 91:2 171:3,5 Cisco 2:13 citation 211:21 212:9 cite 211:15 212:3 212:11 citizens 210:9 claim 116:4 clarification 16:18 17:19 21:21 53:16 62:1 153:4 clarified 81:12 clarify 15:12 105:16 133:19 clarifying 16:14 67:21 class 105:8 148:10 clause 56:8 68:9,9 150:3 clear 46:5 82:11 101:12 131:17 155:13 157:2 158:13 168:6 189:17 213:15 clearly 15:3 69:1 158:5 Clearwire 2:20 clever 31:9,19 climate 206:5 clockwise 4:18 close 8:19 closely 120:2 closely-related 150:15 closest 92:22 closure 47:13 129:19 cognitive 99:17,19 100:1 college 33:12 159:21 Colorado 1:17 come 20:4 24:16 25:3,15 39:9 75:19 83:15 86:1	93:1 95:13 98:7 99:12 107:18 110:15,21 129:19 137:6 161:1 174:16 180:4 183:17 190:17 191:3 195:21 196:1 197:15 203:9,22 206:10 206:22 comes 20:16 86:1 157:22 158:1 175:15 192:3 197:21 comfort 113:13 comfortable 40:21 coming 8:4 62:10 72:17 86:6 122:5 command 146:12 commanded 146:16 comment 3:23 40:13 42:4 203:6 commented 41:17 comments 9:8 13:19 27:16 75:4 82:21 83:2 141:6 144:18 150:11 195:20 202:9 207:7 215:16,22 Commerce 1:2,4 3:5,22 4:8 96:7 137:17 commercial 40:22 43:13 44:4 45:7 46:5 55:6,12 58:12,16 59:8 113:13,15 120:4 124:17 128:6,14 175:19 204:21 205:16 Commission 24:8 103:21 104:2 Commissioner 35:20 commit 114:11,16 211:20
---	--	---	--	---

commitment 123:14 213:12,16 214:10	compliments 37:1 component 125:8 190:13	confines 214:19 conflicting 37:6 confused 45:3	consumer 18:11 89:7,8 91:19,21 104:19,20 105:4	convincing 125:3 Cooper 1:21 6:19 6:19,22 7:2 64:19 66:11,15 77:6 80:9,19 86:14,21 87:3 88:14 93:20 95:3 138:14 169:8 169:11,18 170:10 202:6,8
committed 123:16 180:17 213:9	components 122:1 compromise 28:6	Congratulations 61:17 171:17	contact 165:7 contended 52:19	coordinate 124:12 124:20
committee 1:5,12 4:9 7:15 12:20 34:8 36:2 38:4 39:6 41:13,15 67:2,11,16 72:7 74:17 79:4 82:1 132:17 134:17 142:11 162:11 168:11 172:4,7,10 172:17,22 173:11 173:17 174:4 175:21 176:13 177:8,18 178:4,19 179:6 181:3,22 183:19 184:14 190:15 196:22 198:3,19 199:2,12 204:5 207:9,14 210:8	con 10:14 concept 24:11 25:2 91:22 101:4 102:9 115:4 131:11 142:12 155:15 169:13 170:3	Congress 205:5 206:2	contention 73:13 contentious 63:21 95:1,11	coordinator 158:1
committees 197:11 199:19 202:14	concepts 100:16 102:13 158:17 168:8 179:7 180:15 182:3	connected 93:4,5 126:5,7,16	CONTENTS 3:1 context 16:3 26:22 28:22 30:5 53:18 84:16 109:1 112:18 204:14	core 121:22
Committee's 25:21 207:18 209:1	concern 62:2,4 65:10 73:19 76:5 83:7 105:18 132:20 150:15 163:14	consensus 23:13 49:1 50:9 98:4 206:22	continue 3:11 172:22 174:9 177:19 194:4 213:1,4,7 215:3	Corporation 2:8,20 2:22 6:5
common 96:13	concerned 112:1 131:19 133:10 153:11 157:9 200:11	Consequently 142:18,20	continued 2:1 135:11 163:2 215:1 216:19	correct 14:3 18:12 54:16 131:5 167:1
commons 96:13	concerning 210:14	consideration 11:17 25:11 26:20 29:18 44:5 55:12 58:22 59:4 61:5 133:2 207:5	continues 208:10 208:14 209:18	corrected 142:5,7 215:19
Communication 3:22	concerns 26:10 48:13 50:7 63:13 66:22 78:22 95:18 105:21 129:16 132:9 135:10 140:22 145:5 170:6 212:19	considerations 19:21 39:21 48:15 67:15 133:16 135:4	continuing 149:19 182:12,16	cost 10:3 56:15 63:10 89:6,10 189:2
communications 2:6,8 3:6 5:13 115:19 117:7	concert 137:4,17	considered 30:12 132:13,14 165:8 172:20	continuous 150:4 166:16 198:14	costs 12:7,15 13:2 146:18
community 98:6 104:9 193:18	concerns 26:10 48:13 50:7 63:13 66:22 78:22 95:18 105:21 129:16 132:9 135:10 140:22 145:5 170:6 212:19	considering 11:11 49:20 79:13 130:7 130:19 183:17	contradiction 213:15	counsel 211:11,21 212:3
company 2:9 5:18 13:5 199:4	concerns 26:10 48:13 50:7 63:13 66:22 78:22 95:18 105:21 129:16 132:9 135:10 140:22 145:5 170:6 212:19	consistent 43:3 47:5 56:6 110:3	contradiction 213:15	Counsel's 182:22
comparison 11:19	concerns 26:10 48:13 50:7 63:13 66:22 78:22 95:18 105:21 129:16 132:9 135:10 140:22 145:5 170:6 212:19	constitution 1:13	contradiction 213:15	count 158:2
compelling 176:6	concerns 26:10 48:13 50:7 63:13 66:22 78:22 95:18 105:21 129:16 132:9 135:10 140:22 145:5 170:6 212:19	constraints 38:3	contradiction 213:15	counted 159:3
competition 44:21	concerns 26:10 48:13 50:7 63:13 66:22 78:22 95:18 105:21 129:16 132:9 135:10 140:22 145:5 170:6 212:19	construct 192:14	control 46:17 90:11 127:7 146:12 152:14,15,18 206:5	country 193:5
competitive 75:15	concerns 26:10 48:13 50:7 63:13 66:22 78:22 95:18 105:21 129:16 132:9 135:10 140:22 145:5 170:6 212:19	construction 194:6	controlled 46:3 62:18	counts 31:13,14
complete 30:14	concerns 26:10 48:13 50:7 63:13 66:22 78:22 95:18 105:21 129:16 132:9 135:10 140:22 145:5 170:6 212:19	constructively 212:18	control 46:17 90:11 127:7 146:12 152:14,15,18 206:5	couple 116:15 117:18 129:12 173:2 207:3
completed 185:16	concerns 26:10 48:13 50:7 63:13 66:22 78:22 95:18 105:21 129:16 132:9 135:10 140:22 145:5 170:6 212:19	Consultant 1:15	controlled 46:3 62:18	course 8:8 85:11 197:7 216:8,16
complicated 70:13	concerns 26:10 48:13 50:7 63:13 66:22 78:22 95:18 105:21 129:16 132:9 135:10 140:22 145:5 170:6 212:19	consultation 197:10	controversial 28:11 67:22 97:10	cover 44:5 119:21 180:22
compliment 141:4	concerns 26:10 48:13 50:7 63:13 66:22 78:22 95:18 105:21 129:16 132:9 135:10 140:22 145:5 170:6 212:19		controversy 67:2	covers 52:16
	concerns 26:10 48:13 50:7 63:13 66:22 78:22 95:18 105:21 129:16 132:9 135:10 140:22 145:5 170:6 212:19		convenient 199:15	co-chair 4:10
	concerns 26:10 48:13 50:7 63:13 66:22 78:22 95:18 105:21 129:16 132:9 135:10 140:22 145:5 170:6 212:19		conversation 16:19 39:7 80:10 98:16	Co-Chairs 1:14 3:4 9:15 172:20 210:20
	concerns 26:10 48:13 50:7 63:13 66:22 78:22 95:18 105:21 129:16 132:9 135:10 140:22 145:5 170:6 212:19		conversations 120:14 162:5	Co-Chair's 210:14
	concerns 26:10 48:13 50:7 63:13 66:22 78:22 95:18 105:21 129:16 132:9 135:10 140:22 145:5 170:6 212:19		convince 104:9 172:21	craft 30:16
	concerns 26:10 48:13 50:7 63:13 66:22 78:22 95:18 105:21 129:16 132:9 135:10 140:22 145:5 170:6 212:19		convinced 72:18	Crawford 1:23 5:3 5:3 37:11 38:19

57:6 134:7,11 136:5 138:6 140:4 148:22 151:4 163:1 198:15 215:13 create 62:5 92:1 103:1 109:10 121:5 130:21 159:1 195:12 196:3 created 12:10 68:3 68:8 139:14 159:2 creates 100:4,4 creating 12:3 206:7 creative 205:20 credentials 210:16 credit 171:19 creep 199:22,22 criteria 20:1 138:4 critical 29:15 115:22 116:8 119:7 126:4 127:21 critically 88:22 113:1 122:16 200:2 criticism 65:6 Crocker 198:21 Crosby 1:24 6:11 6:11 cross-referenced 157:17 cross-referencing 158:15 CSEA 12:2 CSMAC 1:5 3:4,19 21:10 79:15 111:12,19,20 119:12 201:9 215:12,20 CSMAC's 213:11 215:10 cull 186:6 current 7:14 12:9 67:7 101:6 114:13 182:6 183:18 189:3 191:19	206:5 currently 102:3 114:7 172:6 176:3 CV 184:11 cycle 105:4 C's 113:22 <hr/> D <hr/> Dale 1:13,15 3:4 8:5,20 94:21 121:4 172:19 173:3 203:19 212:2 216:3 Dale's 80:14 83:6 109:16 damage 131:11 damned 20:22 Darrin 2:10 6:14 database 68:3,8,22 106:18 databases 92:22 164:22 date 106:10 184:16 184:17 185:2 209:6 214:10 Dave's 52:11 David 2:2 5:1,6 42:9 107:20 130:3 134:4 157:6 David's 133:1 day 41:13 97:16 102:13,13 162:11 178:8 196:13 208:21 days 177:3 day-to-day 205:14 de 114:1 dead 89:3 deadline 173:21 deal 66:22 102:16 135:9 158:3 190:12 dealing 98:18 99:5 99:8,19 189:8,9 dealt 100:8 148:13 157:12 158:16 debate 16:11 24:20	44:15 53:14 72:16 76:22 debated 29:13 61:21 debates 216:18 debating 25:2 196:16 December 9:4 208:4,6,17,19 decided 173:16 174:3 decision 25:5,15 35:12 132:15 147:8 166:10 decisions 49:10 55:17 88:7 147:17 149:4 195:5 deep 118:18 134:12 deeper 128:1 deeply 114:22 Defense 113:15 defer 212:16 deficit 206:8 define 103:4 197:12 defined 104:11 130:1 defining 200:9 definitely 34:7 67:3 176:19 definition 120:19 degree 41:12 delete 134:21 166:16 168:7 169:1 deleted 166:4 deleting 162:21 deliberate 179:6 214:11 deliberation 25:22 deliberations 108:1 delicate 28:6,6 37:3 demand 193:6 demonstrated 117:2 214:10 demonstration 114:6,19	denominator 96:13 denotes 59:7 Department 1:2 2:16 96:6 113:14 137:17 dependence 64:13 dependent 65:3 66:1 depending 17:6 188:13 deplete 13:3 depth 61:22 Deputy 2:17 deregulate 46:18 derive 196:15 descend 134:14 described 66:16 69:8 98:20 124:13 210:18 description 159:19 design 46:14 70:4 70:21 156:9,13,13 168:15 169:3 180:2 designated 133:14 133:15 156:17 168:12 172:12 174:19 designed 14:17 15:7,16 22:6,9,16 23:8,12 30:15,16 43:4 54:22 56:21 57:10 58:1 60:8 61:1 132:11,12 133:12,13 145:17 165:6 168:16,17 168:18 169:3 designing 21:6 desired 19:15 Despite 211:8 detail 26:20 36:21 54:10 90:3 99:14 detailed 26:9 68:12 69:9 195:5 198:22 199:7 details 39:16 79:11 197:3 198:5	determine 20:2 209:13 detriment 74:13 develop 117:1 122:15 128:15 205:12 developed 20:1 128:9 developing 75:14 115:20 148:8 development 125:17 156:11 developments 84:17 device 66:18 106:20 206:11 devices 90:13 93:3 93:4,9 94:9,14 98:21 105:22 106:11 107:7 109:16 110:13 127:14 131:5,6,7 150:17,22 153:6 153:17,17 154:1 154:10 155:2 165:5,9,14 166:22 167:12 169:5 devoted 206:13,16 DFS 69:18 dialogue 85:8 195:13,14,22 diatribe 31:10 dictating 138:20 dictatorial 196:21 difference 151:11 151:15,18 different 14:9 16:1 26:1,2 27:2,3 28:1 29:12 31:5 69:20 69:20 71:1,19 85:16 100:4 113:1 121:19 125:7 126:15 127:7,9 151:8 differentiator 142:21,22 differently 159:3
---	---	---	---	--

difficult 21:8 42:18 100:13 187:11 190:1	87:9 89:5 90:8 92:21 100:19 111:10 129:16 153:9 162:16 178:19 185:4 187:21 201:7 203:15 204:14,15 205:2 206:20,21	42:16 43:8,15 45:22 47:3 75:7 130:5 144:14,17 155:9,16,20 157:7 158:14,22	Economic 2:18 Economics 5:11 economist 140:7 145:2 146:7 ecosystem 128:7 ECPC 117:5 edge 124:14 edit 22:7 67:20 130:10 133:1 163:19 164:10,12	175:17 176:1 197:14 206:16 efforts 95:15,15 121:14 136:8 206:13 eight 68:1,5 163:19 164:10,12 either 13:1 29:21 93:4 109:4 130:17 158:10 167:11 170:7 177:14 193:22 207:19 209:3 211:18 elaborated 19:22 electronics 105:4 element 153:20 200:6 elements 54:14 eleventh 202:15 email 24:4,5 209:16 210:2 emails 20:11 195:17 197:4 embarrassing 215:18 embedded 117:19 191:9,15 embodied 204:22 embrace 142:11 embraced 52:17 Emergency 2:4 5:9 117:7 emerges 41:21 emerging 137:16 emphasis 191:22 194:17 employee 181:14 209:22 emulate 173:13 enable 113:9 115:12 122:16 127:10 128:7 enabling 49:15 118:12 encounter 40:15 encourage 127:5 176:20 184:8
difficulty 39:19 151:5,7 dig 199:5 digital 91:6 93:3 dilute 138:18 dimensions 122:12 dinner 208:8 direct 47:21 48:3 directed 65:1 175:20 direction 25:1 27:9 36:5 39:5,14 53:7 53:8,16 67:3 98:1 98:15 155:3 directionality 39:12 Directive 207:15 213:18 directivity 38:14 directly 95:7 Director 1:20 2:5,7 2:12,17,22 disagree 17:21 22:5 22:7 99:22 disagreement 10:6 16:15 34:8 disappointed 108:11 disclose 215:10 discuss 8:8 30:10 85:6 86:3 89:19 discussed 29:20 62:20 68:16 92:14 121:14 193:17 208:19 discusses 30:10 discussing 68:6 100:10 172:4 193:11 discussion 3:7,19 9:11 10:15,16 13:22 20:9 47:8 50:10 62:14 69:18 83:8,18 84:10	discussions 85:12 87:19 88:2 178:21 179:11 180:15 disincentive 12:22 dismissing 131:19 dispatch 181:21 disputes 211:2,9 dissent 180:10 distance 103:11 distinction 20:17 Ditto 208:5 divergent 30:11 49:13 50:21 55:19 dividends 115:16 Division 2:23 doable 25:16 doctor 8:16 doctrine 137:21 document 37:9 96:19 100:13,22 102:11 117:16 119:8 136:16 208:18,20 209:15 documents 215:12 doing 13:7 22:14 34:21,22 36:12 38:17 66:18 78:20 82:16 97:2 118:4 119:13 122:11 124:22 128:2 129:20 141:14 159:20 160:4 172:6 179:17 190:15 195:4 197:11 211:1 dollars 148:8 Donovan 2:2 5:6,6 16:21 18:5,8,11 19:9 23:5,9 42:10	door 99:2 189:15 193:1 dot 125:4 dots 126:5,7 Dr 37:10,11 draft 3:7 8:9 49:7 79:19,20 129:17 162:7 179:3 208:18 209:1 drafted 16:22 135:19 drafts 65:5 198:10 198:12 drawbacks 84:6,7 drawn 30:6 drew 65:6 drive 198:1 drives 51:11,11 driving 19:4 drop 37:16 158:15 dropped 24:5 DSA 89:1,5,11 90:19 due 75:18 130:22 dumb 105:22 duties 174:20 dynamic 115:10 dynamics 87:15 D.C 1:13	edited 23:6 editing 142:6,7 editorial 162:8,14 170:22 171:11 edits 58:8 80:1 95:21 142:9 156:6 162:1,15 effect 14:12 15:2,19 17:5 21:15 22:18 23:12 43:4 45:13 54:22 56:22 57:10 57:14 58:1 60:8 61:2 210:8 effective 16:16 34:10 112:13 effects 26:11 efficiency 10:4 12:17 41:4 42:1 49:14 72:9 75:13 76:18 77:20 81:3 81:14 121:5 138:12 148:8,19 efficient 11:21 40:5 55:13 59:4,16 61:6 74:4,19 121:8 135:13 146:15 147:6,18 163:4 efficiently 58:3,4 59:22 60:14 61:3 115:13 116:11 effort 67:13 112:14 117:11 119:8 122:10,19 123:12 125:21 135:19 141:2,4 146:19 168:6 171:21	
E				
		E 1:24 148:10 earlier 16:20 30:6 103:10 144:10 154:6 202:20 early 182:13 183:9 185:17 197:10 198:9,10,12 200:4 216:4 earth 177:7,17 easier 46:21 198:7 easy 29:2		

encourages 209:11	20:8 197:7	exactly 9:14 128:10	experienced 84:2	100:21 137:5,16
encouraging 53:12	equipment 70:7	128:12 146:22	expert 36:11	149:15,15 174:16
156:11	90:16,21 91:1,8	exaggerating 87:22	177:12 178:15	187:11 189:14
endeavor 179:13	92:5,9 104:12,16	exam 145:13	expertise 39:6	193:15,19 211:8
180:19	106:2 131:20	example 17:9 18:12	expired 173:22	factor 52:19 153:21
ends 177:6	186:14	19:19 39:21 63:1	174:9	187:1,3
energy 144:4	equities 116:10	75:12 81:21 107:2	expires 181:7	factors 28:1 30:11
163:10	error 44:1 76:17	113:16 142:16	expiring 174:5,6	49:13 50:21 55:19
enforce 33:8	209:4	170:15 208:16	explained 121:4	79:13 132:12,14
enforcement 67:19	errors 215:5	209:19	explaining 119:9	184:13
70:2,14,22 83:13	especially 65:6	examples 148:19	explanation 11:20	factual 27:3,3
84:8 98:19 194:6	78:4	149:1,2,5,11	explicit 81:17	factually 151:3
engaged 182:6	essence 138:14	213:19	explicitly 11:19	fair 25:21 26:4 37:5
engagement 122:18	159:1	excellent 61:16	106:15	43:18,21 92:20
180:9	essential 49:18	63:17 216:11	express 77:7 78:6	128:11
engineering 2:14	essentially 91:10	exception 41:22	127:12 129:22	fairly 10:14 62:22
2:23 176:16	91:19 109:17	208:11	expressed 132:20	fairness 177:14
177:13 198:17	127:14 131:19	exceptional 112:9	197:8	fall 116:15
engineers 198:20	158:16	exclusive 106:7	extended 131:13	falling 8:16,21
enhance 80:17	establish 169:2	109:8 189:15	174:1	familiar 203:18
enhanced 135:14	et 125:3	193:22	extensibility	family 50:2,3
163:5	eternity 94:11	exclusively 67:6	117:15	far 9:15 19:7,11
Enhancement	Europeans 85:13	excuse 34:2	extension 200:13	73:12 75:4 132:20
120:5 205:17	evaluate 137:20	Executive 1:21,24	extent 50:19 96:9	fashion 74:12
enhances 80:17	138:11	2:3,19	124:18 131:12	favor 34:16 61:10
81:14	evaluation 11:8	exercise 118:5	133:11 154:14	75:2 171:10
enhancing 82:5	evening 207:21	178:1 181:10	156:7 176:18	FCC 9:20 17:11
enlist 170:15	event 16:10	exercises 179:10	187:8 206:14	26:18 34:13 41:2
177:19	events 133:7	exercising 212:14	External 2:19	41:18,21 45:3
enlisting 190:15	everybody 44:6	exist 127:3 128:16	extract 78:7	53:6 64:5,7 69:4
enormous 36:21	56:11,12 91:4,7	existed 94:9,10	extraordinarily	69:16 85:12 99:1
ensure 70:1,20	95:16 153:5 161:9	existence 82:6	77:12	106:15 116:19
115:18 215:2	161:15 178:21	105:9 135:12	extraordinary	124:17 130:12
entered 212:8	183:7,9 184:1	163:3	77:16	133:8 137:4,18
Enterprise 1:25	195:7 198:7	existing 11:6 41:8	E-Class 148:10	145:4 148:1,5
Enterprises 2:5	199:14	81:6 110:3 128:6		150:9 153:5
entire 40:17	Everybody's 88:22	181:6	F	168:22
entirely 16:12	everyone-has-to-...	expand 82:9	face 102:2	FCC's 41:5
entities 46:6	171:4	expanding 40:5	faces 203:18	federal 9:22 12:5,7
entity 17:12 46:4	everything's	expansive 50:5,10	facilitate 65:22	12:14,17 13:1,5
46:10,16 150:18	129:18	50:13	66:4	32:17 33:4,17
entry 76:17	evident 118:14	expectation 89:1	Facilitated 3:19	68:3,8 96:8
environment 100:4	evolved 79:20	expects 209:3	facilitates 65:4	115:12 116:18
100:6 104:22	150:5 166:14	expense 148:21	facilitating 12:17	117:12,13 127:12
105:1 192:16	evolving 136:18	experience 10:17	fact 15:1 17:2 30:2	172:12 174:19
194:5	139:20	21:13 68:6 195:3	54:6 83:22 90:13	176:3 184:8 187:5
Epstein 2:2 5:15,16	EWA 6:11	202:12	94:14 98:9 100:13	206:7

fee 9:21 10:2 14:11 15:1,7,14,15 17:4 17:12 18:1,18 21:14 22:15,17 23:11 25:12 33:7 43:3 45:13 46:7 46:17 52:3 54:21 56:21 57:22 60:7	175:18 176:7 177:7 179:10 188:10 199:5 209:15	fleshed 89:19 flexibility 49:14 98:19 104:10 106:12 107:5	forms 113:20 forth 16:5 20:11 40:6 101:13 195:13	frankly 46:12 85:9 86:6 96:14 108:10
feedback 118:13 179:20 201:16	finding 113:4 186:3 fine 22:20 71:9 82:15 136:22 139:11 162:10	flip 200:7 flurry 197:4 fly 93:11 focus 11:7 40:18 97:13 125:7 135:3 152:14 161:10 180:7 198:9 199:12,18 200:1	forum 116:14 forward 7:17 13:11 53:10 66:8 67:12 67:15 74:20 76:20 86:3 90:9,9 92:12 93:2 94:18 96:1 107:22 108:9 123:3 124:1 137:7 141:3 144:9 161:21 170:9,18 172:7,20 173:13 174:21 175:13 178:5 180:1,20 182:5 183:4 189:1 190:12 192:4 194:10 212:16 216:18	free 19:2 174:14 Freedom 2:12 frees 121:1 frequency 186:11 friendly 132:8 friends 129:6 front 25:8 64:21 132:21 136:4,6 frontier 113:6 frontiers 83:20 84:17
feeling 14:20 fees 10:10 14:16 16:15 20:2 24:9 24:12,18,21 26:19 27:22 34:9,17 35:16 36:10,14 37:19 38:3 39:15 40:8,22 49:11 54:7 55:18 57:9 61:1 91:17 206:12 206:15,16,19	finish 153:15 Firestone 203:22 firmly 83:19 first 8:7,10 9:19 14:14 19:20 23:17 23:22 24:7 32:14 33:12 35:4 50:18 52:17 61:16,21 65:5 68:4 69:17 75:14 80:21 84:16 86:10 97:21 109:7 109:7 116:4 136:3 141:7,10,11,12,15 142:19 143:4 144:11,12,12,21 145:7,9,9 150:13 150:14 159:9,18 162:21 164:17 166:3 168:9 172:11 181:2 185:6,12 188:20 190:3 194:11 197:21 198:1 201:5 207:9,13 215:15	focused 12:9 82:18 96:1 153:5 204:9 focuses 87:9 focusing 28:9 40:1 41:15 FOIA 212:7 213:12 213:14 214:1,14 214:22 215:12 folks 20:18,21 45:4 61:13 89:22 97:5 107:19 117:4 122:10 128:19 129:8 176:20 177:4	forward-looking 64:9 65:7 74:15 foster 119:15 fought 51:19 found 75:11 99:7 102:11 160:17 Foundation 1:21 4:22 Founder 1:22 2:11 four 7:5,5,6 38:6 91:2 97:7,16 102:5,20 105:17 107:3 108:21 116:9 130:7 134:3 134:22 149:20 152:5 168:20 216:8,9	front-end 125:1 frosted 41:13 full 42:19 49:9 53:7 68:4 105:20 142:19 143:4 150:13 178:19 179:5 198:3 fully 118:11 fulsome 83:16 functionality 127:6 fund 12:3,4,9 62:3 62:4,5 114:15 115:4 205:19 fundamental 78:18 79:8 83:13 108:5 108:13,13 151:11 151:15,18 funding 205:12 206:4,10 funds 12:15 Furchtgott 2:4 Furchtgott-Roth 2:4 5:10,11,11 35:22 57:13 94:22 95:5 139:3,12,19 140:1,6,10,15,19 144:20 147:16 170:13
Fellow 2:7 felt 79:5 100:7 fiber 19:1 field 20:18,21 21:6 31:3 figure 31:6,10,20 31:21 32:4 48:22 70:22 76:8 108:8 113:7 158:8 204:5 figuring 21:13 97:6 200:18 file 183:8 fill 183:12 final 79:18 162:11 finalize 129:16 finally 11:22 117:16 121:10 130:11 133:2,22 165:4 168:21 finance 117:14 find 4:13 31:8 47:13 74:8 85:9 85:10 99:18 100:13,19 107:21	firstly 141:3 fit 118:16 176:19 fits 115:6 123:17 fitting 120:1 five 32:19 51:19 55:1 68:7,21 84:11,11 105:6 118:15 143:12 159:18 163:7 five-year 104:17,18 fix 43:12 45:8,11 83:10 fixed 191:15 flag 10:11	following 70:7 112:19 130:11 162:16 195:16 follows 161:22 Fontes 2:3 5:8,8 126:19 199:9 footnote 68:14 69:10 70:17 110:9 154:13,16 155:5 158:15 160:5 forces 166:9 fore 64:12 forecasted 209:20 foreclosure 44:16 44:17,21 forget 117:6 forgive 87:22 formal 195:20 203:4 formally 169:21 formerly 5:2	fourth 7:22 115:22 FPI 5:21 frame 48:14 181:17 frames 165:15 framework 10:20 75:19 76:2,10 77:1 101:6 Francisco 193:4 Frank 14:3 126:18	frontiers 83:20 84:17 front-end 125:1 frosted 41:13 full 42:19 49:9 53:7 68:4 105:20 142:19 143:4 150:13 178:19 179:5 198:3 fully 118:11 fulsome 83:16 functionality 127:6 fund 12:3,4,9 62:3 62:4,5 114:15 115:4 205:19 fundamental 78:18 79:8 83:13 108:5 108:13,13 151:11 151:15,18 funding 205:12 206:4,10 funds 12:15 Furchtgott 2:4 Furchtgott-Roth 2:4 5:10,11,11 35:22 57:13 94:22 95:5 139:3,12,19 140:1,6,10,15,19 144:20 147:16 170:13 further 10:9 26:13 109:10 136:10,15 166:2 202:16 205:8 206:7 future 1:20 44:20 55:4 59:3,12 60:2

61:4 64:11 88:5 98:2,20 99:14 101:8 103:2 106:13 107:6 109:4 130:21 131:16 165:5 185:5 193:15	getting 24:10 51:13 69:14 123:21 129:19 133:10 157:18 161:10 188:5 195:1,14 210:1 211:20,21 gig 68:21 gigahertz 32:20 68:7 84:11,11 103:13 give 36:22 44:5 55:12 58:21 59:4 59:15 61:5 65:8 65:14 68:14 82:17 90:22 91:14 93:18 94:17 112:10,16 113:12 120:17 142:1 144:7 161:22 175:9,14 182:7 198:22 204:4,7 213:19 given 72:21 gives 105:7 giving 52:21 glad 143:9,9 178:20 glass 53:3 Global 2:13 go 4:17 19:7,12 26:1 30:8 32:15 34:1,12 35:8 36:12 46:15,18 48:6,7 51:14,20 51:22 53:19,22 57:15 69:15 75:4 78:16 79:13 80:13 84:12 85:22 92:18 96:5 102:15 104:8 105:12 109:7,18 109:21 111:13 112:19 113:22 118:18 120:22 128:1 136:10,15 141:17,18 142:17 146:18 152:9 154:20,22 159:5 167:9 172:3 174:6 177:6 178:4 180:1	181:13 182:1,5 183:16 187:20 188:18 192:10 197:14 205:6 209:14 214:15 goal 21:15 25:12 72:7,11 101:7 116:8 124:7 127:7 127:10 188:8 goals 18:2 119:7 goes 42:11,15 101:3 101:13 131:2 154:5 196:19 going 4:12 7:15,16 7:18 8:6 14:14 16:4 20:22 21:7 22:22 23:20 25:17 32:4,13 34:12,14 35:9 36:7,9,16,20 38:2 39:4,10,13 40:15,17 42:20 44:10 48:10 52:4 58:4 65:14 69:14 71:12 72:15,16 73:2 80:10,12 86:3 87:19,21 88:1 89:6,11,12 92:12 93:2 96:1 102:6,15 104:3 105:6 107:15,16 108:19 109:21 110:15,16 114:10 117:6 118:17,21 119:21 120:2 123:7,8,9 126:15 133:22 134:8,18 134:20 158:19,19 159:3,8,14 161:18 161:22 162:1,2,3 162:8,13,14 164:19 169:12 170:21 172:7,20 173:13 174:20 175:11,13,16 177:19 178:5 180:20 181:12 185:15 187:13	190:4,5,17,18 191:7 193:21 194:11,19 196:12 197:22 198:4,5 199:22 204:20 208:9 212:10 going-forward 210:21 gold 63:8,9 Goldsmith 177:10 good 6:20 16:13 20:15,15 22:3 39:3 47:20 50:14 52:9 71:15 72:3 72:14 73:11,16 76:4,13,13,14 78:9,10 81:21 105:11 112:6 118:5 123:21 129:6 130:9 134:19 139:4 143:8,9,9 147:14 168:5 175:3 178:15,21 180:18 191:1 201:22 202:5 203:18 209:14 213:4 goodly 13:21 Google 1:18 6:13 gotten 21:17 207:20 government 2:6 18:16 31:1 33:17 37:20 40:20 41:15 41:19 42:6,12 43:6,12,13 44:3,4 49:18,21 55:5 59:2,8 65:1,21 68:15 97:1 112:4 112:17 114:4 117:12 118:21 119:1,2,22 122:13 123:11,21 124:16 125:12 127:22 132:15 138:21 139:13,14 145:21 146:1,10 147:8,17	148:12,21 153:8 166:9 181:14 192:1,18 193:1 205:9,15 207:15 209:11,22 213:17 government's 116:11 146:5 government-man... 97:4 GPS 32:13 51:7 graduates 33:12 grandfather 99:1 grandmother 98:22 grateful 95:15 great 35:13 44:17 66:17 84:16 103:11 111:7 114:14 116:14 119:6,9,10 136:1 160:19 216:11 greater 44:5 53:17 55:12 57:14 58:22 59:4,15 61:5 greatest 62:2 Greg 5:22 29:9 30:18 33:22 44:15 46:4 69:12 71:16 75:10 81:21 95:19 136:7 140:21 147:11 149:13 156:1,20 170:15 177:19 GREGORY 2:17 Greg's 38:21 78:22 82:14 163:8 ground 95:22 group 7:21 24:16 54:18 98:16 111:9 124:10 158:2 175:13,22 176:17 204:9,18 205:7 206:18,21 grouping 178:8 groups 99:16 187:12 198:2 199:19 205:22
G				
gain 121:6 gains 77:17 gap 69:6,8 gaps 68:3,8,22 Gary 2:2 5:15 20:7 197:6 Gattuso 172:13 175:1,3 182:15,19 183:3 184:5 gear 105:4,9 geared 97:22 gee 35:7,8 72:14 91:1 general 93:21 94:3 94:16 97:20 112:4 118:4 158:17 168:6 182:21 generally 123:2 generate 209:4 generation 112:13 191:19 generic 73:17 genesis 87:6 gentlemen 173:5 geographic 192:22 193:10 geolocation 92:22 164:21 Georgetown 203:17 geosatellites 189:9 GERARD 2:19 Gerry 3:10 66:15 68:14 71:7 95:14 130:4 144:15 161:19,22 162:15 170:7,14 171:17 Gerry's 134:6				

guarantee 104:17	harder 83:9 154:20	136:7 154:14	horizon 65:16 91:3	26:11,12,14,21
guess 7:8 13:22	harmful 49:15	157:18 159:20	104:18 105:8	27:5,10,20 28:16
14:6 15:10 41:22	harmonization	175:22 182:5	host 49:12 55:19	29:17,17 35:15
44:10 50:11 69:19	186:12	190:16 194:12	hour 202:15	54:8 207:10,14
71:19 119:20	Harold 2:4 5:10	199:6,11 200:17	huge 121:5 122:8	implementations
154:13 156:6,6	34:1 35:21 37:15	204:5 215:2,6	128:5 133:10	25:12
177:11 201:2	71:17 83:4 90:1	helped 30:16	148:14	implemented 34:9
guidance 36:11	94:20 108:20	helpful 36:11,20	hugely 82:9 87:17	128:10 155:7
138:16 202:16	132:19 136:22	53:13 54:13 71:10	133:10	157:20
guilty 197:2	147:15 170:12	79:12 80:2 82:14	hundredth 24:4	implementing
Gurss 2:5 5:12,12	Harold's 38:21	84:18 134:8	hurdles 189:5	10:10 31:2 142:15
29:10 48:9	136:7	197:16 199:3,8	hypothesize 94:13	157:22
guys 112:21 129:6	hashed 9:5	202:12		implications 49:21
151:15	hasten 78:4	helping 125:19	I	importance 116:1
H	hate 91:15 158:22	190:20	ICANN 198:17,19	important 24:2
half 84:16 86:10,12	159:17 198:17	helps 107:5 121:9	idea 17:21 50:14	25:7 28:8 30:21
188:14 215:15	Hatfield 1:13,15	121:11 202:11,20	52:8 65:13 117:21	35:6,12 69:5 87:5
halfway 53:8	3:4 4:6 6:17,20	Herbert 1:12	120:18 132:21	88:22 111:8 113:2
half-full 53:4	7:1,4,7 8:7,15	Hey 152:10	134:19 167:20	118:3 119:14
half-solved 200:5	18:6,9,20 19:6	Hi 6:22	178:16 180:13,22	120:5,11 124:6
hand 15:4 58:10	22:8,13,19 45:2,6	high 186:17	192:9	142:11 153:21
handle 90:22 91:14	60:15,18 78:15	highest 18:17 46:15	ideas 98:1 112:6	154:19 167:19
93:18 94:17	82:17 108:2	46:18	116:13 117:18	179:1,4,19,21
hands 78:16 89:22	151:12 152:7,20	Hill 122:2 152:9	119:6,10 121:19	185:12,18 186:3
98:22	153:2 159:16	historically 97:3	123:22 139:4	187:19 196:21
hang 134:22	160:11 161:9	147:6 149:10	178:3 180:8,18	197:18 198:10
happen 21:16	200:3 201:22	166:5	201:7	199:10 200:2,8
87:19 114:4	Hatfield's 42:20	hit 173:10	identified 190:3	205:11
120:16 122:3,3	head 2:15 31:13,14	hits 31:3	identify 58:5 69:6	imposing 18:18
146:22 149:3	headache 96:16	hold 18:13 201:20	103:10 186:22	impossible 103:19
152:17 177:8	headed 27:9 173:15	holidays 177:9	187:14 194:10	139:2
happened 68:13	heading 89:6 165:3	home 90:17	203:8	impractical 38:10
happening 69:2	hear 50:13 66:13	hone 40:7	identifying 186:8	impressed 125:6
122:4	88:15 194:20	honest 32:12 211:4	if/and 81:18	improve 75:13
happens 19:14 32:9	200:14	honor 216:7	ignoring 213:14	215:3
34:15 42:3 147:3	heard 125:10	HONORABLE	illegal 211:12,16	improved 207:19
happier 141:8	175:13 178:8,10	2:11	immediately	improvement
happy 119:14	179:16,17 182:2	Hoover 1:12	134:13	77:19 124:4 150:5
177:1,4 213:20	hearing 86:19	hope 8:22 112:16	impartiality 200:15	166:14 207:17
hard 8:18 35:1,4	179:18	118:14 138:17	implement 20:22	improvements
39:1 47:16,17	heart 20:9 103:14	170:14 172:21	24:13 31:1 32:7	126:8 204:11
85:14 103:6 104:8	heartburn 141:20	207:4 215:18	38:9 162:15	205:8,16 213:3
111:15 117:17	144:8	hopefully 10:3	implementable	improving 12:16
158:8 191:4	heels 86:6	63:21 67:22 132:5	54:9	inadequate 70:11
192:15 195:16,18	held 208:2,3,3,5	173:12 181:9,17	implementation	Inaudible 66:11
197:1	help 36:4 112:13	hoping 23:2,3	9:21 10:8 14:15	incentive 17:6
	117:14 134:13	181:4	24:9 25:18 26:9	35:17 40:2 45:14

56:12,22 57:11,15 58:2 60:9 61:2 120:9 150:18,21 204:22 incentives 3:9 8:12 9:1 12:20 49:7 55:4 59:3 60:2 61:4 112:22 146:5 208:22 incentivize 32:4 57:7 incentivizing 56:11 include 49:13 50:6 50:6,12 180:19 included 47:8 92:11 includes 45:4 87:16 111:19 including 23:15 52:15 126:1 183:7 184:16 inconsiderate 210:9 inconsistent 171:6 incorporate 40:17 42:19 52:8 increase 80:16 increased 81:3,13 incredibly 209:1 incumbent 66:3 independence 200:15 independent 1:15 212:15 indicating 209:7 industry 68:15 186:6,9 187:19 188:19 192:4 193:14 194:20,21 inevitably 83:15 Infield 165:3 inflated 210:19 inform 27:4 information 3:6,22 125:16 173:22 175:9,10 204:7 211:4,22 212:5,5	informed 35:11 infrastructure 106:2 128:14 131:8 169:5 191:9 191:15 initial 54:11 68:18 192:9 199:11 initiative 116:5 innovation 3:17 12:4 62:4 97:3,4,5 115:4 121:18 205:18 innovative 122:15 input 9:22 190:20 195:1 196:3 214:9 inputs 194:16 insert 131:6 159:16 inserted 132:4 inserting 131:11 insiders 210:11 insight 113:13 insights 119:6 inspire 137:22 138:12 instance 100:21 102:19 103:8 instances 27:18 Institute 2:18 5:16 203:20,21 institutional 204:16 instruct 59:1 integrate 11:4 integrated 10:13 Intel 2:8 5:19 intellectual 122:18 intended 20:3 105:17 intensely 192:2 intent 14:13 15:13 28:19 107:1 167:22 168:1 intents 15:12 interaction 192:17 195:16 interactive 195:12 195:22 199:1	interest 43:3 47:6 80:18 81:15 122:1 123:5 185:19 186:5,9,13,17,19 187:19 188:19 200:20 210:16 interested 182:11 209:17 interesting 15:10 20:12 51:3 81:2 interfered 192:5 interference 49:15 104:4 157:14 191:18 interfering 99:3 intermittently 165:7 internalization 146:18 internalizing 10:3 international 49:20 52:16 186:12 189:5 internet 90:14 93:5 93:6 165:7 internet-connected 92:9 interoperable 116:7 interpret 25:8 interpretation 14:22 26:5 interpretations 15:21 interpreted 15:5 17:1 interrupt 169:8 interval 90:22 91:11,11 93:6,10 165:12 introduce 201:11 introductions 6:9 introductory 80:15 145:12 invent 112:19 inventory 122:21 123:6	investigate 210:15 investing 115:14 investments 115:16 115:21 involve 190:7 involved 189:8 in-depth 190:4 iPhones 160:8 irritating 57:9 issue 32:10 40:18 40:19,20 45:8,11 54:1 68:20 69:17 82:14 99:6 112:1 123:18 171:7 185:11 187:10 199:15 202:13 issues 23:15 47:20 47:22 50:4 53:20 62:15 94:18 95:2 95:10,11 98:17 99:4,7,8,13,14,20 100:8 107:9 112:15 113:21 123:3 124:17 170:16 176:11 178:19 186:11 188:18 190:16 196:16 197:12 201:11 212:16 item 3:1 171:1 items 205:10 iteration 7:14,22 ITT 2:22 6:4 ITU 28:5 i.e 49:17 <hr/> J <hr/> Janice 2:11 5:20 40:11 45:9 52:13 56:4,5 67:16 71:17 83:3 90:5 95:19 132:19 196:8 197:8 Janice's 136:7 January 1:9 174:2 184:18 207:21 Jello 155:20	Jennifer 2:21 6:2 23:15,19 27:13 29:11,22 30:7 48:10 50:15 52:12 Jim 207:8,12 job 8:18 32:2 119:9 122:11 128:3 Joe 158:2 172:13 172:14 174:11,15 174:16,16,19 John 125:13,18 126:3 join 177:18 joined 8:4 Joy 111:22 119:4 JR 2:15 judge 187:18 188:19 judgment 212:15 judgments 88:8,9 Julie 2:22 6:4 19:8 23:1,14 39:17 Julie's 28:9 jump 78:16 88:11 91:16 158:4 jumps 85:1 86:12 jungle 89:15 junk 89:14 J.D 1:23 <hr/> K <hr/> Kahn 2:7 5:19,19 13:21 14:3,5 15:17,20 16:17 22:1,20 37:10,12 43:5,10,16,22 45:19 90:2 92:19 94:1,5 104:13 124:11 160:7 164:18 165:18,22 Karl 3:14 6:6 23:18 23:19 67:1,9 94:21 97:17,19 104:13 109:13 110:2,17 111:14 117:17 130:8 157:9 161:4 167:4
---	--	---	---	---

170:15 172:4 175:11 177:22 179:17,20 182:4,7 196:7 199:6,9 Karl's 117:9 130:15 131:10 154:6 keep 36:1 126:7 137:12 188:5 193:1 199:14,16 211:4 keeping 126:5 kept 14:6 Kevin 2:7 5:19 13:20 16:22 17:18 21:3 34:2 71:17 83:3 90:1 107:1 124:10 184:6 Kevin's 21:19 37:8 38:21 39:3 164:16 key 54:14 119:21 120:6 121:12 122:19 125:7 187:1,3,10 190:13 197:9 kick 114:9 kind 4:18 10:13 11:9 12:20 14:20 23:14 32:8 33:9 52:21 53:8 65:14 76:11,15 77:20 83:7 91:6 97:22 107:4 112:18 114:15 124:14,15 124:20,22 156:8 187:15,17 189:7 191:14 194:16 195:8 196:4 197:2 205:22 kinds 75:20 85:16 87:18 93:19 193:10 Knauer 1:18 knocked 191:21 know 9:8,12,14 10:1,5,13,19,20 11:9,11 12:20	13:7,10,14 14:5 14:16 16:11 27:11 28:5,10 29:4,11 29:12,16,22 30:9 32:7,11 33:1 34:4 34:16,21 35:7 37:16,18,22 38:5 38:8 39:11,14 41:5,12,14,21 42:4 43:18 44:18 44:22 48:13 50:21 52:4,17 53:17 54:13 56:4 58:13 62:7 63:2,9,12,13 66:21,22 71:20 75:3 76:1,18 78:7 79:4,11,14 80:2 83:17,22 84:2,15 85:6,15,17 88:11 89:1,6,17,17 90:8 90:10,19 91:6,9 91:10,17,18 92:3 92:4 93:1,10,12 93:14 94:15 99:5 100:3 101:15 102:15 104:16,20 105:3,5,20,21 107:1 109:4,12,15 109:17 110:3,6,9 113:3,17,22 114:1 114:8 117:4 118:1 118:2 119:5,13 121:19 123:11 124:14,19,21,21 125:3 128:4,11 129:5 133:9,22 134:17 135:18 136:9,21 137:2 138:21,22 142:6,8 144:3 148:10,12 148:20 150:5 152:16 153:4 154:13,18 155:9 155:18 156:11 157:9,15 170:19 175:4 177:10,12 177:14,16 179:16	183:6 189:8 191:2 192:8 193:2,7,10 195:8,17 196:3 197:2 199:13,13 201:2,4,9,10,11 202:17 203:8 204:12 213:8 214:21 knowing 24:19 knowledge 180:12 211:9 knows 10:6 125:18 <hr/> L <hr/> L 2:2 Lab 2:8 lack 102:12 157:9 209:10,16 213:21 lacking 99:8 lacks 46:10 lady 32:21 34:4 land 4:13 149:21 language 11:15 30:12 37:9 43:2 47:5 50:6,13 57:8 68:2 82:18 109:13 110:1 156:18 162:22 168:6,20 170:16 large 86:13,15 126:14 largely 92:8 181:9 larger 188:6 largest 45:11 Larry 1:18 3:5,21 6:7,12 7:10 111:15,16 184:5 196:7,14 199:7,10 213:15 216:12 Larry's 117:17 161:5 latest 195:8 Laughter 16:8 34:5 47:18 law 1:23 5:4 17:13 89:15 211:18 212:3,11	laws 211:15 213:12 213:15,22 214:1,2 214:6 215:11 lay 104:7 190:1,5 laying 75:9 189:13 lead 89:2 125:2 135:13 163:4 208:20,22 209:21 leader 37:5 leaders 112:8 leadership 64:18 173:2,11 leading 124:14 lead-in 143:18,20 lean 124:1 learn 125:11 learned 10:21 216:15 lease 113:4 leave 16:12 97:15 113:8 216:4 led 83:22 139:14 147:18 172:18 left 14:6 46:20 77:15 legacy 78:2 90:9 94:18 97:19 106:1 120:22 150:17,22 153:17 154:9 165:14 legal 2:5 101:5 182:1 211:20 212:15 214:19 legalities 212:17 legality 210:15 211:1 legislation 110:22 113:8,9 119:19 120:3,8 121:12 123:15 204:19,22 legislative 3:16 112:17 legitimate 89:19 legs 16:10 lend 25:5 lesser 187:7 lessons 10:21	letting 97:2 let's 21:18 25:2 36:14 39:11 47:11 65:15,17,20 72:7 72:8,9 73:17 74:22 76:7 77:1 89:21 107:10,10 115:10 140:22 141:1,1 152:14 157:1 level 18:18 77:19 116:4 125:6 133:6 levels 116:3 leverage 128:13 license 17:10 18:13 18:14 33:6 64:13 64:17 65:3 66:2 72:8 78:4 98:5 151:13 153:9 licensed 19:4 72:22 74:5,14,18 76:14 77:22 78:2 98:20 100:2,6,11 103:20 104:9 110:13 131:6,20 135:15 143:1,14 150:16 151:18 152:8 153:5,19,20 154:21 155:3 157:14 163:6 193:18 licensee 18:1 licensees 104:1 120:9 licenses 66:3 lieutenants 32:15 life 105:4 lifetime 94:15 lifted 55:22 light 52:21 184:2 liked 143:16 limitations 29:19 limited 17:22 46:6 60:19 line 4:13 6:18 7:3 144:7 167:3 184:10
---	--	--	--	---

lines 29:4 62:14 149:20 200:22	204:15	122:1,20 139:4 148:13 157:12	138:3,9,15 169:14 169:16 170:3	124:12 133:6 136:21 144:22
link 185:3 208:13 208:18,22	long-term 91:11 191:9 192:14	196:16 197:13 202:8,14,18	March 207:3	145:15,16 146:10 150:3 151:8
linkage 102:12	194:14 197:18 204:11 205:13	lots 72:13 75:11 126:15 148:11	marginal 63:10	152:16 153:4 158:6,19 179:2
linked 23:2	look 21:11 25:17 48:4 53:12 64:20	louder 86:22 95:3 love 37:13 38:12	Mark 1:24 2:9 5:17 6:11 47:10 203:11	180:21 183:15 212:9
linking 53:13	64:22 65:16,17 69:20 70:19 74:20	112:20 146:7	marker 104:7	meaning 88:2
links 208:15,15 209:3	77:2,3 91:18 96:7 96:11 102:4 104:5	low 45:19	market 96:22 145:18,19 146:4,6	means 25:9 39:8 193:12 195:22
list 47:19 51:5 52:7 106:17 141:18	105:3 111:13 124:4 126:21	lower 186:16	146:16 147:7 148:20 166:9	meant 81:9,11 111:21 132:1
178:6 182:14 185:9 186:18 190:6	128:14 137:5 139:3 150:20	lowest 96:13	marketplace 105:10,11 122:6	140:18
listed 27:22 208:12	152:8 158:6 170:18 185:4,17	low-cost 89:8	markets 146:7	meat 67:18
literally 108:11 154:9 177:16	187:18 189:2 190:8,12 191:8	luck 201:22	Martin 1:21 2:21 6:3,19	mechanism 92:6 206:4
littered 150:17 152:4	192:4,20 193:9 194:2,5,11 198:4	L5 51:7	Marty 6:21 64:18 65:14 66:9,13,14	mechanisms 70:2 193:16 194:8
little 20:18 31:10 38:16 44:11,13	216:18	<hr/> M <hr/>	66:17 80:4,7,21 86:17,18 88:11,17	meet 127:20
45:2,15 56:5,18 61:22 86:18,21	looked 33:12 178:6 188:20,21 189:14	M 2:5,10	95:6 136:20 170:1 202:22	meeting 1:7 4:7 7:14,16 8:1 9:4
90:4,7 95:3 110:22 111:2	looking 25:14 28:2 80:20 116:10	MacCARTHY 203:11,16,17	Marty's 94:2 95:15 139:18	41:18 49:19 60:19 79:18 108:14
116:2 153:11 154:11 172:10	118:1 138:5,10 139:1 147:10,15	main 10:2 178:18 210:12	mash 151:16	110:18 129:5 178:2 180:4 181:5
194:17 200:11 216:4	159:4 186:9,20 187:2,4,6 188:15	maintain 52:3 200:15	masses 104:11	181:18 183:6 201:5 207:18,22
live 191:18 192:16 203:10	190:9 192:13 194:15 196:2	making 20:14 73:8 93:11 115:21	match 8:22 188:16	208:2,3,5,17,21 209:5,16,21 210:2
LLC 1:22	loop 179:20	126:16 160:3 170:2 189:22	matter 161:12 177:15 216:22	210:10,17 212:1 213:20
LLP 1:18	Los 193:4	managed 138:21 204:17	mature 85:7	meetings 178:11,13 178:14,20 180:2
loaded 41:10 45:1 141:12	lose 146:14 153:20 201:10	management 1:4 2:15 3:15 4:8	maximizing 49:14	180:20 208:9 210:5 214:17
lobbying 176:11	loses 38:14	11:5 204:12	maximum 41:3 118:7	meets 188:12,14
Lockheed 2:21 6:3	lost 80:9 144:14	Manager 1:18	maxing 42:1	megahertz 51:8 89:16 103:8,12,18
long 39:15 52:22 72:15 92:9 93:6	lot 14:21 27:14 29:15 34:6 36:17	managing 1:17 2:12 115:20	McHENRY 2:9 5:17,17 47:14,19	147:1 155:12 175:18 187:3,6,8
98:14 106:5 158:7 165:12 170:19	39:1 41:3,4 44:19 51:12 72:17 73:1	mandate 85:17	48:17 53:19,22	188:7,11 204:13
191:4 205:15 213:13 214:14	73:13 85:8 86:7 89:1,7,7 90:8	mandated 20:3 150:9	mean 21:12 31:17 32:22 37:18 38:12	member 4:21 5:1,3 5:6,8,10,12,15,17
longed 122:17	91:18 96:1,16 97:2 98:5 107:9	mandates 211:2	43:16,17,18 52:6 58:15 59:8 62:20	5:19,20,22 6:2,4 8:14,20 13:21
longer 74:14 112:12 138:6,8	111:16 119:6	mandatorial 140:20	79:6,20 81:12 84:9 85:7,13	
178:13,13 181:11		manufacturers 138:1	88:21 90:18 91:4 91:18 92:7,17,20	
		map 85:2,6 86:2,5 87:4 89:18 96:18	93:14 101:15 108:11 109:6	
		136:13 137:15		

14:3,4,5 15:13,17 15:18,20 16:2,9 16:17,21 18:5,8 18:11 19:9,11 20:8 22:1,20 23:5 23:9 26:3 27:12 27:14 29:10 30:19 33:19 34:3 35:22 37:12 38:19 39:18 40:12 42:10,13,16 43:5,8,10,15,16 43:20,22 44:9 45:5,10,19,22 47:3,14,19 48:9 48:17 50:18,22 51:2 52:14,20 53:3,19,22 55:7,9 56:2,14 57:6,13 58:11,19 59:6,19 60:4,7,11 62:16 62:19 63:20 66:11 66:12,15,17 69:13 70:20 71:4,7,9,11 71:15,18 73:21 75:7,11 77:6 80:4 80:7,9,14,19,21 81:8,10,16,20 82:10 83:5 86:14 86:21 87:3 88:10 88:14,16 90:2 92:19 93:20 94:1 94:2,5,22 95:3,5 104:13 105:15 107:12 108:18 109:19,20 124:11 126:19 130:5 131:22 132:3 133:19 134:1,7,11 135:22 136:5,6 137:11,14 138:6,8 138:14,19 139:3 139:10,12,17,19 139:21 140:1,3,4 140:6,10,15,19 141:2,7 142:3,13 142:16 143:5,8 144:14,16,17,19	144:20,22 145:8 145:11,15,21 146:1,2,4,6,9,13 146:21 147:16,22 148:4,7,18,22 149:2,10,14,19 150:1,7,12 151:4 151:7,10,14,21 152:2 153:3,13,22 154:5,11,16 155:4 155:9,14,16,18,20 155:22 156:3,21 157:7 158:14,22 159:8 160:7,16 162:20 163:17 164:1,4,7,9,11,15 164:18 165:18,22 166:2,12,22 167:2 167:3,7,8,13,15 168:3,13,14 169:6 169:8,11,15,18,21 170:1,10,13,18 171:18 182:10,17 183:2,11 196:9 197:7,19 198:11 198:15 199:9 200:21 201:17 202:6,8 209:2,22 210:3 215:13 members 64:3 67:16 74:18 79:4 172:22 174:4 177:7 181:11 183:4,8,19 209:12 209:17 membership 176:12 memorandum 115:7 mention 102:19 103:9 mentioned 121:17 172:17 173:16 Meredith 216:12 merely 39:7 merge 136:11 168:8 190:6	merit-based 63:3 mesh 160:12,14 met 1:12 20:2 methods 180:7 Mhz 19:4 Miami 193:3 mic 35:21 203:10 Michael 1:19 3:9 4:21 8:11 26:16 37:1,4 54:17 87:20,22 108:19 131:2 Michigan 1:23 5:4 microphone 95:8 203:9 microphones 155:11 microsecond 90:19 microwave 18:22 19:1 middle 95:22 midyear 174:6 mightily 95:13 migrating 12:16 migration 12:8 Mike 8:13 19:1 130:8 169:10 203:16 millions 148:7 mind 36:1 62:8 73:1 83:9 84:15 85:10 86:10 mindful 116:13 minimum 13:9 ministerial 181:10 minute 82:21 172:9 204:3 210:6 minutes 65:14 161:2,7,20 172:3 207:22 misfit 134:12 missing 45:9 120:6 122:8 mission 7:20 13:3 124:15,17,18 199:22 missions 68:17	176:2,4 mitigate 143:22 mitigated 163:13 mobile 121:9 149:22 Mobility 140:4 mode 86:1 model 198:18 modernizing 12:7 modified 70:16 moments 202:13 money 37:20 38:5 62:9,12 121:11 month 10:18 95:21 178:2 190:2 197:3 months 37:2 198:1 207:4 208:2 morning 6:20 162:5 184:22 morning's 8:2 Motorola 5:2 mouse 97:6 move 13:11 23:14 36:4 56:4 66:7 67:12 76:20 79:6 108:9 130:2 134:9 134:21 137:14 141:3 150:13 161:4 162:18 170:9 181:21 183:4 189:1,3 192:4 194:10 movement 155:11 moves 170:19 moving 76:22 144:9 212:16 MSTV 2:2 5:7 multiple 29:5 116:3 210:7 multipurpose 127:16 multiyear 165:15 mundane 90:3 Mylet 2:10 6:14,14 <hr/> N <hr/> N 1:15	name 171:19 207:11 nameless 5:15 narrow 40:8 127:14 199:17 205:6 national 2:4 5:9 85:2 86:7 169:13 nationwide 116:6 naturally 41:20 nature 69:3 near 193:7 202:16 Nebbia 3:14 6:6,6 23:16,21 53:11,21 54:5 56:10 57:3 61:19 62:17 97:20 117:8 157:21 158:18 165:16,19 167:18 184:20 nebulous 38:16 necessarily 202:15 necessary 74:14 205:3 necessity 145:1,17 need 13:9 18:3 19:7 19:19 20:4 30:11 31:5 32:3 34:17 36:1 38:4 47:12 48:4,22 59:18 60:15 70:1 71:12 71:22 81:11 106:5 106:8 107:22 112:18,22 118:17 121:2 123:11 125:11 126:8 128:14 137:20 140:3 143:13,14 145:11 167:22 171:8 174:10 175:8 176:4,6 179:10 184:7 185:4 187:12 188:12,15 191:7 192:13,19 193:9 194:2,3 196:4,17 200:14 201:3,19 205:8 210:22
---	--	---	--	---

needed 155:8 174:14	166:3 NIST 128:2	111:14 122:10 124:16 130:11	42:2 119:1 144:10 173:9 186:15	143:8,9 144:19 145:6 147:5 149:8
needing 85:1	NITRD 125:10,21	134:18 137:3,17 137:18 138:4	189:22	149:14 150:8,10 150:10,12 154:10
needs 15:7 26:13 51:4 70:16 101:12 102:14 122:3 128:8 140:14,15 155:15 181:2 194:20	nominate 173:19 173:19	163:16 168:21 172:6 175:17 200:9,13 202:10 204:8 212:17 213:8,13	occasions 210:7 occur 19:17 97:3 occurring 111:3 occurs 152:7	156:1 159:11,14 160:19 161:14,17 162:17 163:15 164:15 165:22 166:2,19 168:5,19 169:7 170:5 171:16 183:2,11 184:19,20 188:5 194:13 203:14 215:21
neither 211:5	noncommercial 58:17	213:8,13	October 111:14 185:8	166:2,19 168:5,19 169:7 170:5 171:16 183:2,11 184:19,20 188:5 194:13 203:14 215:21
nervousness 126:12	noninfrastructur... 105:1	NTIA's 13:13 211:10,21	odd 142:21 145:2 156:9	old 143:6
network 116:7,12 116:18 117:3,15 121:11 122:17 126:20,22 127:1 160:12,14 165:11	noninterference 102:1	NTLA 3:15	OffComm 10:18	OMB 11:2 28:16 63:5
networking 125:14 125:15	noninterfering 130:16 131:12	number 2:4 5:9 26:10 44:17 49:5 115:3 119:21 130:7 136:10 167:5	offer 68:7,13 185:20 191:16	once 24:1 34:22 35:4 61:20 62:7 77:18 90:17 103:4 104:6,6 112:12 158:12 167:16 191:11 192:5
networks 127:2,3 127:19,20	nonspectrum 18:7 18:9	numbers 104:12	offered 9:7 11:14	once-in-a-decade 112:11
neutral 133:4	non-Federal 9:22	nuts 84:19	offering 11:9	one's 27:7,7
never 44:12 85:21 101:17	non-government 192:18	N.W 1:13	offers 21:21	one-directional 147:19
nevertheless 108:15	non-governmental 58:14 204:20	<hr/> O <hr/>	office 3:15 31:15,15 172:13 182:22	ongoing 10:6
NEVILLE 2:14	non-interfering 67:8	object 44:7	Officer 1:25 2:3	online 184:18 210:15,21 212:5,6
new 1:21 4:22 41:7 41:8 62:10 64:1 65:2,18 68:16 74:21,21 83:20 96:10,11 102:21 106:7 115:8 117:2 130:13,20 132:15 133:3 136:18 156:16 159:7 166:6,7 168:12 169:1 174:20 177:7 181:3,8,11 181:22 183:7 184:16 191:19 193:3 204:19 205:20	Normally 4:11	object 44:7 objection 14:21 objective 28:19 40:7 78:12 137:19 138:10,16,18 200:19	offices 31:14	open 46:11 50:12 112:4 123:21 132:15 192:22 195:12 207:15 213:17 214:18
new 1:21 4:22 41:7 41:8 62:10 64:1 65:2,18 68:16 74:21,21 83:20 96:10,11 102:21 106:7 115:8 117:2 130:13,20 132:15 133:3 136:18 156:16 159:7 166:6,7 168:12 169:1 174:20 177:7 181:3,8,11 181:22 183:7 184:16 191:19 193:3 204:19 205:20	notably 207:17	objectively 88:3	Official 172:13 174:19	opened 96:11
new 1:21 4:22 41:7 41:8 62:10 64:1 65:2,18 68:16 74:21,21 83:20 96:10,11 102:21 106:7 115:8 117:2 130:13,20 132:15 133:3 136:18 156:16 159:7 166:6,7 168:12 169:1 174:20 177:7 181:3,8,11 181:22 183:7 184:16 191:19 193:3 204:19 205:20	noted 66:19 98:15 99:15 160:21 165:4 167:4	objectives 49:19	offices 31:14	opening 3:2 7:9 84:21 106:7 109:2 130:12 133:2 135:3 168:22 189:15
new 1:21 4:22 41:7 41:8 62:10 64:1 65:2,18 68:16 74:21,21 83:20 96:10,11 102:21 106:7 115:8 117:2 130:13,20 132:15 133:3 136:18 156:16 159:7 166:6,7 168:12 169:1 174:20 177:7 181:3,8,11 181:22 183:7 184:16 191:19 193:3 204:19 205:20	notice 173:18 184:9 184:17 209:17	observation 90:12	Off-the-record 141:6 150:11	openness 213:16
new 1:21 4:22 41:7 41:8 62:10 64:1 65:2,18 68:16 74:21,21 83:20 96:10,11 102:21 106:7 115:8 117:2 130:13,20 132:15 133:3 136:18 156:16 159:7 166:6,7 168:12 169:1 174:20 177:7 181:3,8,11 181:22 183:7 184:16 191:19 193:3 204:19 205:20	noticed 184:21	observe 92:8 93:16	Oh 8:15 22:17 53:3 71:6 80:6 140:16 143:5 153:12 164:1,4 165:22	operating 106:14 193:1
new 1:21 4:22 41:7 41:8 62:10 64:1 65:2,18 68:16 74:21,21 83:20 96:10,11 102:21 106:7 115:8 117:2 130:13,20 132:15 133:3 136:18 156:16 159:7 166:6,7 168:12 169:1 174:20 177:7 181:3,8,11 181:22 183:7 184:16 191:19 193:3 204:19 205:20	notices 195:7 210:10	obsolescence 85:19 90:6	okay 4:6 7:7 8:7 13:18 20:6 22:4 23:7,11,13,15,19 29:7 48:7,20 54:15 57:19,22 58:4,5 59:1,16,18 61:9 63:14 71:11 71:15 92:2 97:17 97:19 102:8 107:8 107:14 108:17 110:14 134:1,2 137:8 139:10 140:16,21 142:13	operationalize 92:16
new 1:21 4:22 41:7 41:8 62:10 64:1 65:2,18 68:16 74:21,21 83:20 96:10,11 102:21 106:7 115:8 117:2 130:13,20 132:15 133:3 136:18 156:16 159:7 166:6,7 168:12 169:1 174:20 177:7 181:3,8,11 181:22 183:7 184:16 191:19 193:3 204:19 205:20	noting 121:17	obsolete 152:10 165:14	Obuchowski 2:11 5:20,21 40:12 42:13 43:20 44:9 45:5,10 52:14 83:5 88:10,16 146:21 196:9	
new 1:21 4:22 41:7 41:8 62:10 64:1 65:2,18 68:16 74:21,21 83:20 96:10,11 102:21 106:7 115:8 117:2 130:13,20 132:15 133:3 136:18 156:16 159:7 166:6,7 168:12 169:1 174:20 177:7 181:3,8,11 181:22 183:7 184:16 191:19 193:3 204:19 205:20	notion 94:16	obstacles 103:1 109:10 130:21 131:16		
new 1:21 4:22 41:7 41:8 62:10 64:1 65:2,18 68:16 74:21,21 83:20 96:10,11 102:21 106:7 115:8 117:2 130:13,20 132:15 133:3 136:18 156:16 159:7 166:6,7 168:12 169:1 174:20 177:7 181:3,8,11 181:22 183:7 184:16 191:19 193:3 204:19 205:20	November 203:20 208:1,10 210:17	obvious 155:5		
new 1:21 4:22 41:7 41:8 62:10 64:1 65:2,18 68:16 74:21,21 83:20 96:10,11 102:21 106:7 115:8 117:2 130:13,20 132:15 133:3 136:18 156:16 159:7 166:6,7 168:12 169:1 174:20 177:7 181:3,8,11 181:22 183:7 184:16 191:19 193:3 204:19 205:20	NPRM 195:19	obviously 41:12		
new 1:21 4:22 41:7 41:8 62:10 64:1 65:2,18 68:16 74:21,21 83:20 96:10,11 102:21 106:7 115:8 117:2 130:13,20 132:15 133:3 136:18 156:16 159:7 166:6,7 168:12 169:1 174:20 177:7 181:3,8,11 181:22 183:7 184:16 191:19 193:3 204:19 205:20	NPRN's 195:7			
new 1:21 4:22 41:7 41:8 62:10 64:1 65:2,18 68:16 74:21,21 83:20 96:10,11 102:21 106:7 115:8 117:2 130:13,20 132:15 133:3 136:18 156:16 159:7 166:6,7 168:12 169:1 174:20 177:7 181:3,8,11 181:22 183:7 184:16 191:19 193:3 204:19 205:20	NSF 124:15,21			
new 1:21 4:22 41:7 41:8 62:10 64:1 65:2,18 68:16 74:21,21 83:20 96:10,11 102:21 106:7 115:8 117:2 130:13,20 132:15 133:3 136:18 156:16 159:7 166:6,7 168:12 169:1 174:20 177:7 181:3,8,11 181:22 183:7 184:16 191:19 193:3 204:19 205:20	NTIA 6:6,8 9:20 12:1 29:3 34:13 45:3 53:6 54:7 63:2,3,4 96:6			

operationally 97:12	originally 173:22	paragraph 49:9	161:21	permission 106:17
operations 2:14	OSTP 125:20	68:4 69:17 75:8	Paul 77:2	permit 65:1,19
187:5	126:4	80:22 105:20	pay 33:7 92:4	person 111:22
operators 143:22	ought 47:16 48:3	136:3 139:7	114:17 115:16	152:13 171:9
opinion 212:4	92:7,10 94:8	141:10,11,13	paying 46:17	174:6 177:9
opinions 37:4	outcome 19:15	142:18,19 143:4	PEHA 125:15	personally 16:13
opportunistic 106:4	24:22	144:12,21 145:5,9	people 26:2,16,17	96:5 160:13 214:5
opportunities 113:10 122:12	outcomes 19:17	150:13 159:19	26:17 29:16 31:4	personnel 214:3
128:13 178:14	40:3	162:21 163:8	31:9,19 32:1	perspective 12:21
179:5 191:16	outcome-oriented 19:16	164:17,21 166:3	50:12,17 51:6	13:4 41:21
203:5	outlined 118:15	166:14	53:6 57:9 62:5,8	pertains 42:6
opportunity 3:23	outlines 180:14	paragraphs 158:7	71:20 77:2 85:13	phenomenal 128:3
10:3 56:8,15 85:5	outreach 195:2	pare 48:10	96:16 98:8 103:14	Phil 3:16 107:16
112:12 115:15	196:4	parlance 28:5	103:16 105:5	110:21 119:18
116:17,21 118:10	outset 82:11	part 30:20,21 60:4	108:3,8 114:8	124:11 126:18
120:12,13,15	outside 100:10	78:10 86:2 87:5	115:19 116:15	129:1,10 134:12
122:8 124:4	outstanding 196:11	93:8 99:7 103:22	120:18 125:9	172:16 175:13
125:22 128:5	overall 12:21 30:17	108:19 109:7	127:5 129:16	182:3 195:2
178:16,18 191:1	71:21 72:20	114:21 115:5	144:5 146:14	Philadelphia 193:3
204:10 206:1,6	102:11 116:5	122:19 123:5,21	147:20 152:8	Phil's 110:19
216:14	119:8 121:6	125:4 144:10	173:18 176:15,18	phone 6:10 8:5
opposed 28:17 29:3	127:10 180:7	154:8	176:22 177:4,16	61:14 128:20
38:10 53:8 61:14	oversight 43:17	partial 77:19	179:4,12 182:7	152:9,11 159:12
73:7,16 76:10	overtaken 133:7	partially 189:18	183:21 184:4	160:19 192:9,10
77:1 94:3 131:5	overview 75:9	PARTICIPANT	185:19 195:13,18	201:15
154:1 156:9	142:2 161:22	140:5 145:19	199:5	phrases 109:8
171:14	196:11	147:2,12	people's 32:6 62:8	phrasing 45:1,1
optimally 118:17	overwhelming	participated 9:7	107:17 135:9	Ph.D 2:17
optimistic 122:2	197:5	64:4 95:16	Pepper 2:12 57:21	pick 48:18 192:8
126:11	<hr/> P <hr/>	participation 215:1	58:11 69:13 70:20	picnic 84:12
option 22:2 32:18	pace 122:5	215:7	71:4,7,11,15	picture 118:18
48:21 106:21	package 121:13	particular 17:10	80:14,21 81:10,16	154:12 188:9
options 11:19	page 3:1 24:5 49:4	28:19 46:2,10	94:2 107:12	piece 120:2 121:12
17:22 21:21 90:15	49:7 55:15,22	101:16 106:19	108:18 109:20	121:16 179:19,21
order 8:8 18:4 25:8	61:8 68:1,5 69:18	112:17 134:15	151:7 154:5	pieces 118:15,15
35:11 106:6	71:3,4 105:19	150:18 186:22	160:16 163:22	place 30:8 39:12
112:19 155:6	142:18 143:3,12	particularly 100:20	164:1 167:3,8	74:7,9 75:1 183:7
189:10,13	144:16,17 150:13	104:20 111:16	perfect 22:2	places 27:3 167:5
organization 126:14	159:18 162:21	182:4	perfectly 118:22	13:14 59:2
organize 118:6	163:7,19,21 164:8	parties 19:20	135:19	86:7 116:20 185:7
organized 91:5	164:10,12,20	Partner 1:17	performance	185:7 188:6
181:22	166:3 208:7	parts 72:4 125:8	137:20 138:11	189:11 190:1
original 32:12 69:7	pages 29:5	193:5	performed 176:3	planned 55:5
	paid 32:21 197:21	pass 209:13	178:2	planning 11:5 12:6
	panels 178:15	Patagonia 177:8	period 95:11 129:7	96:21 118:10
		path 84:13 85:22	150:5,6 166:15	123:8 201:12
		107:21 123:2	permanent 106:5	205:13

plans 7:16 180:4	75:6 195:9	161:5	186:16,18 188:14	programs 55:5
plate 63:8	positive 36:5	Presentations 3:12	191:4 196:20	58:21 59:3,7
plating 63:10	possibilities 87:14	presented 54:17,18	problem 21:5	148:14
play 62:6 127:22	185:20 189:16	presenting 176:9	40:13,15 45:18	progress 13:13
137:6 200:9	possibility 189:1	preserved 139:6	52:15 70:5,9	166:15 210:14
plays 116:3	191:10 206:19	President 1:19,24	105:14 131:14	project 114:19
please 23:22 95:4	possible 26:11 35:7	2:2,4,9,12,14,19	144:1 200:4,10,18	projects 114:6
161:9 212:3	38:12 83:21 127:8	2:21 175:20	209:18 210:18	promise 210:14
point 21:17 28:9,11	141:17 165:13	presidential 115:7	problematic 137:1	promises 213:4
28:11 30:7 31:9	167:9 188:22	President's 207:15	problems 46:1	promote 66:1,7
37:13 38:2,13	191:6	213:17	48:16 84:14 92:14	67:12 71:22 72:6
41:6 45:12 78:18	possibly 12:6 29:14	presiding 1:14	131:10 196:17	72:8,8,9 74:8
79:16 80:14 83:6	214:19	pretty 15:3,8 41:14	214:4	76:17
86:9 90:3 103:21	post 212:4	108:4 196:21	proceed 9:15 27:1	promoting 10:4
109:17 111:21	posted 184:9	204:11	proceeded 136:17	40:4 74:13 75:17
114:5 120:7,8	207:22 209:6,8	prevent 163:11	proceeding 64:5,7	75:22
122:11 126:6,10	211:19	primarily 11:8	process 11:5,12,18	propagation 49:17
128:11,11 130:15	posting 210:15	74:18 186:10	62:10 118:7 144:3	properly 22:9,16
131:2 139:18	postings 215:16	primary 101:18,19	162:17 163:9	23:7 86:11
154:19 174:10	potential 48:16	102:7,10 103:15	178:4 181:8 182:1	property 15:8
179:3 187:15	49:20 56:3 84:6	130:14 142:20,22	183:16 185:8,13	proposal 137:10
196:20 197:4	92:13 130:6 186:7	175:17	186:2 195:12	138:15
201:1 202:5	potentially 44:21	Princeton 5:4	196:12,20 199:11	proposals 77:8
213:11 215:15	165:10	principle 22:9,15	202:4 204:16	206:1
pointed 13:14 67:9	powers 158:3	24:11 62:2 213:9	211:4 212:7,8,15	propose 69:9 132:7
points 20:15	practical 24:13	prior 60:5,6 208:3	213:6 214:9,18	141:16 194:14
109:14 130:9	25:4,14,16 38:10	208:17	215:2 216:13,16	proposed 30:7
156:4 201:14	98:17 99:4 155:17	priori 104:16	processes 49:22	54:20
point-to-point	precise 109:13	priorities 185:10	55:21 119:11	proposing 78:8,14
18:22 19:1	110:2	190:6	processwise 170:14	161:3
police 99:2	precision 109:22	prioritization	procurement 11:12	protect 176:4
policies 65:1,21	preclude 106:9	185:8 186:2	11:18	protocol 68:21
179:12	109:4	prioritizing 187:14	producing 186:13	provide 18:14
policy 2:13,18,19	predicate 74:3	prism 65:17	Product 1:18	35:17 36:11,20
2:21 10:18 17:16	predicates 27:4	prison 51:14	productive 8:21	55:4 60:2 61:4
18:2 26:22 27:8	predict 88:4	private 13:5 17:12	productivity	92:12 98:10 112:5
31:1,12,18,22	preparatory 43:1	122:14	202:20	123:20 124:6
32:7 49:19 111:2	75:9	privilege 171:11	products 89:8,9	137:19 138:16
112:14 172:14	prepared 83:11	privileges 162:8,14	91:19	165:13 178:14,16
policymakers 88:6	84:20,22	170:22	professional	180:12 200:20
138:17	Preparedness	pro 10:14 107:4	200:20	204:6 205:19
politically 41:9	117:8	probably 15:2	professor 1:16	providers 44:18
polling 4:12	prerequisite 13:12	22:10 34:13 93:12	159:21 177:10	138:1
portion 45:20	present 1:15 2:1	93:15 96:16 112:2	200:4	provides 17:19
58:20 206:12,15	89:3 101:6	112:11 121:2	program 1:20 2:22	90:4
portions 45:15 57:2	presentation 79:19	139:4 150:4	31:14 125:17	providing 17:5
position 41:5 74:1	107:16 110:17	176:10 181:2	203:5	18:16 23:13 40:2

45:13 54:22 56:11 56:22 57:10,15 58:2 60:8 61:2 118:12 179:17 prudent 89:4 public 3:23 5:13 17:15 18:2,13,21 43:3 46:8 47:6 80:18 81:15 112:9 116:2,2,6,12,14 116:20 117:2,14 121:8,11 122:16 123:18,20 126:20 126:21 127:3,11 127:13,16,18 128:8 195:6 203:5 207:7 208:5 209:2 209:5,13,16,18 210:3,5 211:3,10 212:5 214:9 215:12,22 publicly 36:9 211:7 211:19,20 215:18 Public-Safety 2:6 publish 210:20 211:11 pull 35:21 71:13 pulled 106:19 purchase 33:17 purpose 10:2 25:19 36:1 40:9 127:15 204:18 205:9 purposeful 111:18 purposes 12:2 30:5 135:6 203:9 205:15 push 34:15 204:12 put 16:3 29:22 34:20,21 47:4 51:13 52:3 54:4 73:17 74:22 75:8 76:9,9 77:1 87:14 93:15 110:8 111:16 125:22 141:4 159:20 173:18 190:21 195:19	puts 53:17 putting 51:13 175:7 197:13 P-R-O-C-E-E-D... 4:1 p.m 216:22 <hr/> Q <hr/> qualification 30:3 qualifications 29:13,19 183:20 184:12 210:19 qualified 184:13 qualify 153:9 quality 142:20 143:2 207:17 question 17:16 19:10 23:17,22 37:13 44:10 58:12 61:20 69:15 82:3 92:20 157:8 182:11 184:6 192:3,20 193:13 196:10 213:21 questions 26:8 83:14,14 84:19 93:19 112:20 118:3 119:15,18 124:9 126:17 128:19 162:17 174:12,13 175:8 176:9,10 192:15 196:6,14 197:12 199:7,12,18,20 200:1 quick 23:21 157:7 quickly 9:13 66:8 120:17 142:17 166:1 170:20 185:1 quite 9:5,10 16:14 17:3 44:15 46:12 46:13 62:21 98:3 122:2 173:10 quits 32:19 quorums 180:9 <hr/> R <hr/>	R 2:19 radio 99:17,19 101:20 163:11 rah-rah 84:10 raise 26:7,8,10 37:20 132:12 171:7 194:22 raised 45:12 48:15 67:1 81:22 95:19 95:20,20 99:7 130:9 131:3 132:9 212:20 raises 17:15 raise-the-concern 171:2 raising 38:6 58:10 ran 177:9 range 12:14 ranks 199:5 rapid 104:22 RAY 2:14 Raytheon 2:16 reach 95:22 119:9 177:1,4 195:5 react 178:1 179:4 reaction 179:18 read 14:7 15:1 20:11 23:5 24:19 24:20 28:14 49:6 57:20 59:18 60:16 72:1 74:12 81:2,4 81:5 85:11 144:10 164:12,14,15,22 214:22 reading 72:12 73:19 ready 4:4 155:21 real 21:4 47:15 72:12,12 98:17 99:4 105:14 114:4 122:17 123:5,13 196:1 198:22 201:20 204:15 realistic 206:1 realistically 89:11 realities 194:21 reality 191:17	reallocate 106:13 reallocation 103:2 106:9 109:5,10 130:22 131:16 187:4 reallocations 132:13 really 11:9 13:12 20:9,16,19 21:2,7 21:13,14,15 28:20 32:5 35:12 36:22 46:16,17 47:15,16 47:20 52:22 65:8 65:15 66:21 67:14 67:17 68:11 78:5 82:15,18 85:21 87:11 90:3 96:3 101:15 104:8,10 108:3 110:11 111:6 116:14 117:4 124:20 129:8 135:3 139:7 140:7 158:8 177:15 195:13,16 196:10,17 197:1,1 197:11,16,17,22 198:4,14 200:17 202:11 204:9,19 205:10,19 reapply 174:7,10 175:8 reappointment 183:20 184:1 reapproved 93:9 rearguing 108:4,12 REASER 2:15 30:19 33:19 51:2 131:22 132:3 134:1 148:7 159:8 182:10,17 183:2 183:11 201:17 reason 40:20 41:5 49:4 51:7 77:21 78:10 190:22 194:21 210:6,12 reasonable 15:8 73:4 93:7 105:3	212:11 reasons 121:3 Reauthorization 165:3 Rec 63:15 recall 119:4 181:12 receive 202:10 recertified 91:10 93:9 recharter 7:18,22 181:6 recirculate 162:6 recirculated 171:1 reclaim 150:22 recognition 173:1 recognize 94:8 95:1 95:9 120:4 173:3 174:18 recommend 10:7,8 26:20 67:5 79:12 83:12 102:20 130:11 168:21 183:12 recommendation 11:1 12:1 13:17 14:1 21:19 27:4 28:18 29:3 30:1,3 32:14 33:11 34:12 38:15 42:11,21 46:13 48:12 54:20 58:8 61:21 62:1 73:8,17 84:20,22 85:4 86:5,9,15 87:4 88:19 89:20 96:2 97:7,11,14 102:5,19 105:17 107:3 108:21 130:7 131:13,18 132:11 133:5 134:3 139:5 152:5 156:8 158:9 159:2 159:10 168:8,9,10 183:14 204:21 recommendations 9:12,18 19:12 24:3 28:13 30:18 36:3,3,6 42:8 56:1
--	--	--	---	--

66:21 72:21 76:19 83:9 86:12 96:4 97:15,22 134:15 135:2 156:4 157:10,13,16,19 158:4,7,13,16 166:20 168:7 178:7,12 recommended 63:2 63:4 92:16 106:3 recommending 24:8,17 40:22 132:17 156:16 206:9 recommends 9:20 12:1 51:1 168:11 reconvene 161:8,16 201:6 record 66:19 93:17 161:12 209:7 213:13 216:22 records 209:6 211:10 recruit 177:1,18 redefine 104:3 redesign 15:11 reduce 31:13,15 57:2,8,12 red-lined 101:1 reference 29:21 48:12,14 69:14 103:9 165:17,20 references 110:4 referred 117:20 referring 30:2 refers 167:6 reflect 180:5 reflected 28:7 176:12 reflecting 200:13 reflective 206:20 reflects 68:17 96:20 reform 112:14 regard 176:22 regarding 49:11 55:17 137:21	regardless 31:11 99:9 101:1 regime 66:1 67:7 67:13 113:2 114:7 115:5 143:1 155:3 register 184:8,16 regroup 202:17 regulate 33:4 regulation 2:21 64:15 100:17 regulations 18:15 46:3,7 regulator 107:5 regulatory 17:7 51:4,8,10,21 52:1 52:7 101:5 rehash 64:6 rehashing 65:11 reimburse 12:5 reintroduce 4:14 reject 212:10 rejection 212:12 relate 103:16 215:11 related 12:7 99:20 101:20 111:1 115:5 119:20 129:13 170:8 186:11 relates 58:13 relationship 199:1 relevant 120:8 religious 39:14 relocation 12:3,9 62:3 114:15 187:5 189:15 190:7,10 reluctant 64:6 rely 162:14 remaining 183:3 remarks 3:2 7:9 38:21 141:22 remember 9:13 102:7 removing 75:3 renew 105:7 renewed 94:15 reopen 60:21 78:17	79:8 reopening 184:17 reorganization 103:2 106:9 109:11 130:22 131:17 repacking 121:3 repeatedly 85:15 replacing 141:10 151:5 162:22 report 9:2,11,17,19 10:7,12 19:22 20:13 21:9,17 29:20 38:15,22 39:22 42:19,19 47:9 48:16 50:20 50:22 54:1,17 55:16 56:7 61:10 61:17 64:9 65:5 65:13 67:1 69:4 69:16 74:10 77:15 78:1 82:12,13 83:17 85:4,9 93:21 94:3,7 96:15 105:19 110:10 111:14 125:21 129:13 133:11 134:9 135:8,11,16 137:2 157:15 158:3,10 158:20 163:2 167:5,10 170:8 171:11,16 207:2,2 209:1 reportedly 77:9 reporting 87:5 reports 3:8 8:2,9 180:14 195:15 202:21 214:12 report's 13:16 represent 188:22 representatives 199:4 request 176:15 198:16 211:17 214:22 requested 172:19	212:6 213:11 requesting 173:18 requests 214:14 215:12 require 124:13 165:8 171:2 required 204:20 216:4 requirement 14:18 140:2,11,11,20 141:5 182:18,20 182:21 requirements 70:4 117:4,13 127:21 136:18 139:14,20 184:15 requires 11:3,17,20 requiring 90:21 93:8 94:4 165:10 rescue 134:9 research 2:18 12:6 124:14 125:1,16 138:1 reserve 106:12 resolution 130:2 resolve 18:4 resolved 23:3 resolves 131:14 132:5 resources 11:4,4 13:11 respect 11:10 126:19 180:9 186:8 respectful 176:2 respond 108:20 178:1 195:20 212:19 responded 215:14 response 61:15 63:16 128:21 159:13 171:15 193:21 203:2 216:1 responses 54:12 responsible 211:6 rest 43:19 166:16	169:1 restate 36:5 86:19 result 14:18 20:3 97:5 136:18 139:20 202:3 resultant 15:6 results 144:4 163:9 186:7 204:2 resume 184:11 resumed 161:13 retain 97:14 169:12 retire 150:19,21 retiring 151:5 revenue 205:19 revenues 116:5 revenue-neutral 206:3 review 9:13 181:13 184:3 185:10 186:4 reviewed 63:3 reviewing 137:18 revise 28:16 revisions 11:2 revisit 41:8 revolution 122:4,7 rewrite 11:15 109:21 re-charter 173:17 RICHARD 2:15 Rick 27:11 29:8 30:18 159:7 rid 76:17 153:19 ride 122:7 right 4:16 7:5 8:14 8:15 12:19,22 14:4,17 16:17 34:18 35:2 38:8 39:13 42:4,12 43:8 45:5 46:22 47:10 48:5 49:3 51:12 53:20 54:15 59:16 60:10,22 61:1,9 62:16 71:12,13,14 74:16 76:11 77:17 88:9 103:9,13,16
--	---	--	--	---

105:22 110:5,17 114:13,20 115:18 120:1 123:7 124:13,22 126:6 127:12 128:6,22 131:21 132:2,13 133:21 136:4,5,6 138:19 139:21 140:16 146:11,13 148:1 149:6,9 150:6,7 153:2 155:18,22 156:19 162:19 163:17,18 164:7,19,20 165:17,21 166:12 167:7 168:3,4,14 168:15,17,18 169:6 170:3 171:21 198:8,10 198:11 201:3 203:11,17 214:16	75:11 80:4,7 141:2,7 142:3,13 142:16 143:5,8 144:16,19,22 145:11,15,21 146:2 149:19 150:1,7,12 151:10 151:14,21 153:22 154:11,16 156:3 156:21 rotates 192:11 Roth 2:5 routinely 113:15 row 204:1 rubric 175:16 rule 194:6 208:11 rules 17:8 70:8,9 103:1,5 106:14 109:9 137:5,19 156:10,13 168:15 168:16,17,18,18 169:2,3 180:9 209:12 ruling 214:22 run 63:6 92:9 148:15 182:21 running 109:18 122:10 runs 55:21 92:5 rush 148:9 179:9 R&D 126:1 R-2 96:17	136:6 137:11,14 138:8,19 139:10 139:17,21 146:6 148:18 149:2,10 149:14 162:19,20 163:17 164:1,4,7 164:11,15 166:2 166:12 167:2,7,13 167:15 168:3,14 169:6,15 170:1,18 171:18 197:19 198:11 San 193:4 satellite 191:13 194:13 satellites 113:16 satellite/earth 191:12 saying 14:8,8 22:14 22:15 25:11 33:19 34:13 43:13 50:14 56:16 61:11 74:6 77:1 94:2,6,7 96:6 104:15 133:20 136:14 139:13 160:12 171:12 says 8:16 14:14 43:2,11 44:2 51:22 59:2 68:15 72:6 75:19 76:16 77:2,14 88:19 90:16 102:20 106:2 109:8 114:15 139:19 141:13 143:20 150:4,15 157:5 159:21 195:9 198:4 200:4 211:14,16 scarcity 143:14 scared 196:13 scattered 76:11 scattershot 76:4 schedule 110:20 201:18,20 scheduled 181:18 184:21 191:13	210:5 scheduling 180:13 schemes 54:9 School 1:23 5:5 Sciences 2:23 scope 82:13 197:20 198:4,9 199:13,14 199:18 201:19 se 132:18 search 78:21 185:3 searching 41:6 seat 4:4 seats 161:15 second 11:1 17:17 19:14 25:9,10 43:1,5 52:16 53:15 54:19 55:20 68:9 79:18 80:15 80:22 86:12 105:19 114:5 136:15 139:5,8 142:19 144:21 145:10 150:14 169:9 174:17 190:8 204:1 secondary 101:18 101:18 102:1,6,7 102:21 130:13,18 secondly 181:10 Secretary 3:5,22 7:9 171:22 section 11:6,15 19:22 77:8 96:2 97:14 164:19 166:4 167:17 sector 122:14 Security 198:18 see 17:16 25:2 27:21 35:2 49:5 50:12,16,20 54:14 64:21 66:4 71:6 81:1 108:12 111:7 114:11,18,19 117:9 120:15 124:5 138:12 147:11 153:12 172:14 176:8	178:20 182:13 seeing 123:16 124:19 216:18 seen 44:13 64:10 84:9 sees 203:18 select 188:13 selected 11:21 selecting 211:6 send 50:20 Senior 2:7,12,14 3:17 sense 13:4 17:4 21:1 44:1 53:7 57:4 71:8 76:10 99:15 127:8 128:15 132:16 155:17 204:4 sensitive 110:19 sent 201:20 sentence 14:1,14 15:11,22 19:20 25:9,11 30:9 42:20 43:1,6,11 44:1 50:19 52:9 52:18 54:20 55:3 55:9,20 68:10 79:2 80:15,22 81:2 92:17 135:9 135:10 136:2,15 139:8 141:9,11,13 144:12,21 145:7 145:10 149:22 150:14 151:8,17 159:10 166:5,13 166:13,17 sentences 23:6 29:14 30:5 37:17 49:2 53:15 55:15 61:7 separate 18:15 89:13 151:22 separately 168:1 series 26:7,8 185:11 servants 112:9 serve 216:7,14
	S			
Rob 5:12 Robert 2:5,12 93:13 role 74:22 111:10 111:19,20 120:6 127:21 137:6 200:9 roll 82:8 rolling 105:8 room 1:12 4:12,18 108:8 160:2 172:14 Rosston 2:17 5:22 5:22 34:3 58:19 59:19 60:4 71:18	safety 5:13 18:13 18:21 46:8 116:2 116:3,6,12,14,20 117:2,15 121:11 122:16 126:20,21 127:3,11,13,16,18 128:8 safety-related 51:16 Salemme 2:19 3:10 63:18,20 66:12,17 71:9 73:21 81:8 82:10 135:22			

served 129:6	short 103:11	single 41:19 54:1 158:12	somebody 7:3 21:10 33:8 88:3 99:3	140:13 143:7 146:8,20 147:4,9 148:6,17 149:7 151:20 152:1,12 152:19 154:15 156:14 157:3 158:21 160:10,15 164:6 166:11,21 167:14 169:20 172:15
service 17:7,9 18:16 137:22 142:20 143:2 216:6	shorter 94:14	sir 123:4 175:1 203:6	somewhat 40:14	sorry 22:11 29:8 71:2 74:11 86:17 88:11,14,16 95:6 137:9 150:14 153:3,14 154:22 157:5 165:18 169:18
services 49:19 61:7 101:21 102:10 103:20	shown 216:13	sister 128:2	sort 4:14 17:1 21:14 32:3,10 33:3 34:11 35:15 37:15 39:20 44:22 45:4 50:1 60:18 60:20 63:9 71:18 72:2,5,13,15,17 72:20,21 73:7,16 75:9,16 76:3,7,11 77:4 81:17 84:10 85:1,22 91:5 94:9 94:10 97:1 98:21 100:3 106:22 110:3 117:17,18 121:14,17 123:2 127:6 141:13 144:3 156:10 198:14 204:1,7 205:13	special 181:14
session 178:18 181:3 215:20	shows 78:2	sit 8:19 179:6	sorts 113:10	specific 39:19 40:14,16,18,19 42:5,5 49:16 56:9 64:14,16 67:5 76:20 77:3 85:19 88:13 94:4,7 101:11 112:1 135:2 157:13,18 158:13 176:15 180:8 191:21 201:3 202:9 211:15
set 17:22 80:2 92:2 115:17 173:10,12 183:4 185:9 196:14	shrinks 38:13	site 159:22 160:16 163:16,17	sound 89:5	specifically 26:7 44:2 63:1 99:19 105:17 212:11
setting 167:20	shuts 91:12	sitting 44:14,18	sounds 75:16 140:11,11,20 147:19	specificity 13:16 36:19 157:10,22 200:1 202:10,19
set-asides 206:10	side 10:14,14,22 26:11 61:21 169:16 189:17,21 194:4,5 195:9,10 200:7 204:21 205:9	situated 149:15	space 2:16 31:15,15 64:5 104:20,21 106:6,16 155:6	specifics 65:8 67:18 175:12
seven 41:2 69:18 71:4,5 163:21 164:3	sides 37:4 42:18 45:4 47:7	six 51:19	speak 47:11 66:14 95:7 210:13	spectacular 129:8
shackled 33:3	SIF 28:17	skip 57:8	speaking 33:21 43:9 45:21 47:2 57:5,18 58:18 59:11,14 60:17 61:18 63:19 140:9	spectrally-efficient 166:6,8
share 13:1,2 95:18 102:10,22 190:7 205:20	sign 20:20	sky 114:2		spectrum 1:4 2:9 2:15 3:13,14,15 4:8 5:18 9:21 11:4,8,18,20 12:3 12:4,5,17,18 13:2 18:13 19:2 21:14 24:9,12,18,21 27:21 33:4,17 34:4,17 36:10,14 37:19 38:3 39:10 39:15 40:3,5 41:3 41:4,6,16,18 44:14,19 45:15
shared 2:9 5:18 102:7,8 106:7 109:8 130:14,17 189:18 193:16 194:5	significant 54:6 185:20 189:1,12 189:20	slide 110:18		
sharing 13:6 65:11 65:19 77:5,18,20 78:10,12,13 83:14 85:18 96:8 99:16 99:18 100:1 113:2 113:3 120:16,17 123:10 131:14 135:14 138:13 157:13 163:5,11 177:13 189:16,20 190:9 191:8 192:6 193:12,15 194:3 195:6	signify 61:11 171:12	slightly 15:11		
sheet 164:5	similar 168:20 201:1	slip 181:20		
Shelly 203:21	simple 97:13 160:4 213:21	sloppily 68:21		
shepherded 37:1	simply 10:8 17:13 18:19 36:5,15 78:18 82:7 92:12 106:20	SMAC 208:3,7 209:21,22 210:16 210:17,18 211:11 211:14		
shift 18:7	Simultaneous 33:21 43:9 45:21 47:2 57:5,18 58:18 59:11,14 60:17 61:18 63:19 140:9,13 143:7 146:8,20 147:4,9 148:6,17 149:7 151:20 152:1,12 152:19 154:15 156:14 157:3 158:21 160:10,15 164:6 166:11,21 167:14 169:20 172:15	SMAC's 209:14 210:13 211:17,22		
shooting 181:19		small 75:8 142:9		
shoots 195:8		smaller 142:6		
		smart 32:1 108:7		
		smartest 111:22		
		smoke 23:10		
		snow 209:20		
		Snyder 207:8,12,12 212:21 213:10 214:13 215:9		
		soft 95:6		
		solely 126:21		
		solicit 9:21 201:7		
		solution 11:21 75:7 90:20 100:9 130:6 189:20 200:19		
		solutions 25:14 92:13 196:1		
		solve 45:18 196:17 196:18		
		solved 84:13		
		solves 52:15 53:14 131:10		

46:2 49:12 51:13 54:7 55:4,18 56:15 57:1,16 58:3,3,21 59:3,13 59:20,22 60:2,14 61:3,4 62:3,4 64:14 65:3,4 66:2 66:6,6 67:5,10 72:9 73:4,7,9,11 73:11,18 74:4,19 75:13,15 76:18 77:11 78:3,9 80:17 81:3,5 85:2 87:8,11,15,18 91:17 96:21 98:10 98:13 99:1 100:22 101:3,4 102:2 109:15 110:11,12 111:2 112:14 114:7,15 115:8,10 115:13,20 116:5 116:11 117:21 118:9,9 119:8,22 120:5,22 121:1,9 122:6,13,14 123:2 123:9 124:16,17 126:2 133:5,9,12 133:14,15 136:16 138:11 143:13 144:4 146:12 148:8,16,19 151:1 153:7 163:10,12 167:21 169:13 175:18 176:7 177:12 185:3 186:11,16,17,21 187:21 189:3 191:22 192:21,21 193:6 194:1 203:21 204:11,17 205:15,16,21 206:11,15,16,19 spectrums 32:16 77:22 118:2 Spectrum-based 18:8 spectrum-efficient	137:21 148:15 156:12 spend 172:2 185:21 spent 33:1 spirit 14:16 213:17 spirited 9:10 spoke 207:9,13 spot 203:14 Stability 198:19 staff 179:18,21 197:10 202:11 211:11,14 212:17 stake 64:1 stand 125:13 173:5 203:7 standard 120:19 173:12 standing 184:6 standpoint 101:5 188:20,21 stands 117:6 Stanford 2:18,18 6:1 177:11,20 Starbucks 160:8 stars 202:3 start 4:11,16 34:22 35:4 72:5 87:7,13 114:2 134:17 135:21 136:14 162:20 183:5 187:13 193:11 started 4:5 26:1 35:5 51:6 194:7 starting 181:7 stat 117:21 123:9 State 207:11 statement 10:18 14:17 15:1,4,9 17:2 24:7 184:11 statements 19:13 19:15,18 20:5 210:16,19 states 1:1 69:2,3 stating 90:15 stations 191:12 status 3:12,14 51:4 51:8,10,21 52:1,7	130:18 statutory 110:4 stay 37:13 126:16 198:7 steering 199:19 stepped 104:1 steps 3:20 111:10 135:13 163:3 Steve 198:21 stewards 125:20 stimulated 149:15 stimulation 145:4 146:10 stock 117:12 stories 147:21 story 125:3 straight 57:16 straight-up 14:10 stranded 106:1 107:7 131:1,4,20 169:4 strategic 123:8 204:10 205:13 Strategy 2:19 streamline 28:12 street 107:18 111:4 strengthens 37:9 Strickling 3:5,21 6:7,7 7:9,11 8:18 171:22 172:1,16 173:9 175:6 183:15 184:19 Strickling's 213:16 strike 130:13 145:7 145:9 155:4 strikes 40:8 striking 154:8 strong 37:4 98:5 183:20 strongly 24:17 34:16 98:7 127:5 184:7 struck 43:16 101:2 160:11 structure 180:19 214:20 structured 114:3	struggle 98:17 struggled 95:12 studied 54:10 studies 32:13 54:12 study 9:20 10:8,9 14:14,18 15:6 24:9,11 25:3 26:13 27:10,20 28:16 29:17 30:20 31:7 34:14 36:9 36:14 37:19 38:9 39:20 40:17,21,22 48:1 54:6 62:10 114:18 studying 24:13 26:12 35:12 study's 47:22 stuff 20:19 33:3,9 89:12 103:11 125:2 141:12 148:11,13 193:5 stunning 122:5 subcommittee 3:7 3:9,10 8:9,12 9:2 37:2 64:4 74:2 82:2,16 95:12,17 135:20 171:18 Subcommittees 178:17 179:2,13 Subcommittee's 74:1 75:5 subject 9:3 18:14 102:22 103:6,7 109:9 130:20 submit 173:20 submitted 95:21 submitting 173:21 subsequent 21:10 substance 160:6 substantial 131:1 144:11 substantive 181:1 substitute 18:22 subtext 42:15 successful 103:18 successors 173:13 sufficient 50:19	70:11 suggest 20:1 50:8 124:6 134:20 136:2 164:19 suggested 11:14 37:8 39:2 48:11 107:2 114:21 163:1 suggesting 79:9 214:17 suggestion 42:17 42:22 77:9 130:10 135:7 151:9 163:8 164:16 196:10,19 suggestions 176:21 177:5 181:1 suggests 106:6 135:12 163:3 suit 188:7,8 summarize 33:16 49:3 50:3 204:1 summarized 9:18 29:14 170:7 summarizes 50:1 summary 29:2 58:7 161:2,18 summer 175:20 Summit 41:18 Sunday 207:21 Sunshine 209:12 super 159:2 support 12:1 53:9 84:20,22 96:15 121:9 128:7 131:8 135:20 170:15 175:22 190:16 215:15 supported 96:19 supporting 116:6 175:16 supports 11:1 supposed 28:20 98:11,12 sure 13:10 14:7,19 17:3 18:3 27:8 34:3,15,17 36:17 45:17 55:8,11
--	--	---	--	--

60:20 80:6 92:19 95:5 98:3 117:14 126:16 129:14,21 142:22 170:2,16 213:5 surprised 90:7 surrounding 46:3 Susan 1:23 5:3 38:18 107:20 130:3 134:5 Susan's 136:1 141:9,11,13 151:9 sustaining 49:18 switching 159:17 system 18:10 21:6 121:9 209:17 systems 2:13,17 12:8 59:10,10 61:6 150:10 191:19 192:18 194:13	179:2 181:15 183:6 191:20 195:2 204:3 216:19 takeaways 28:15 taken 39:20 49:8 79:1 takes 69:16 181:11 183:12 talk 7:15,19 10:20 32:3 45:3 59:9 73:5 78:11 80:8 86:21 110:22 122:21 175:11 180:11 187:22 191:4,11 talked 63:8 102:22 112:21 116:1 120:10 121:20,21 156:5 205:17 talking 27:17 34:7 51:6 87:7,13 90:18 92:8 93:3 94:13 101:12 104:21 109:14 115:7 130:15 131:4 153:16 172:3 179:7,12 191:12,22 194:7 195:2 talks 10:1 43:19 69:19,22 102:5 105:20 110:10 125:22 tandem 126:9 tap 12:14 task 37:3 tax 17:14 18:19 46:20 52:3,6 TDWR 68:17 team 111:15 162:15 196:15 technical 49:16 103:1 109:9 152:21 169:2,3 176:9,16 189:20 193:11,16 194:3	194:18 195:6 198:16 technicals 130:20 technical-based 193:14 technique 93:17 techniques 92:11 94:4 technological 64:11 143:21 163:13 technologies 2:12 65:16,18,22 66:7 75:14 85:18 89:15 100:5 115:8,12,14 115:21 117:1 122:15 137:6,22 146:15 147:6 156:12 166:8 technology 2:8,13 2:21 3:17 64:21 65:11 74:21 77:10 77:18 78:5 85:2 86:5 87:10,10 88:8 94:12 96:11 100:8,9 125:14,16 136:16,19 137:15 138:9,17 139:15 143:16,19 147:18 148:9 160:14 166:7 169:13 170:3 188:13 189:4 TechStat 117:22 teleconference 1:19 1:22,25 2:8,10,15 9:4 tell 19:20 76:12 80:19 87:6 91:4,7 103:4,17 169:17 183:1 195:15 211:18 212:9 telling 53:12 temporal 191:18 ten 92:4 150:13 161:2,7 166:18,19 185:16 tentacles 112:5	119:10 tents 80:2 107:9,21 129:13 ten-year 13:14 term 58:13 59:7 98:15 101:14 106:6 174:6,9 204:16 205:16 terminologies 101:19 terms 7:20 10:2 24:20 40:1,8 90:6 98:18,19,21 100:15,20,21 102:12 109:14 116:10 126:21 157:18 172:5 173:10 174:4 178:9 182:5 189:2 194:7 196:11 terrific 38:22 122:11 territory 64:2 test 68:16,18 114:5 114:9 125:2 testing 68:21 69:7 70:4,12,21 text 28:20 30:6 46:12 49:2,4 50:2 69:8 70:16 83:6 98:11 thank 4:5 6:16 8:3 20:5 29:6 37:7 39:18 40:10 53:10 58:5 63:20 69:13 87:2 128:22 129:8 129:10 130:5 134:3,10 169:7 172:1 173:7 174:21 175:1 202:21 203:3 207:6 215:21 216:6,17 thanks 8:4 9:6 19:11 36:22 58:5 110:14 202:22 theirs 183:8	theme 71:22 136:20 theoretical 20:17 20:19 21:5 54:12 theoretically 154:20 thing 21:8 32:11 33:13 40:7 51:5 51:16,18 56:2 69:11 77:4 98:21 100:3,12 102:18 113:14 114:6 123:13 137:13 141:8,16 142:21 145:2 156:10 174:3 179:15 194:22 205:5 things 10:15 14:9 24:2 28:14 35:5 38:7 41:8 48:4 51:3,12 62:11 71:21 72:13 75:12 75:20 76:15 79:12 91:1,16 103:15 104:14 105:21 108:5,13 111:18 114:3 122:22 123:5 124:12 126:15 131:15 136:11 137:3 138:22 139:6 141:18,19 142:4,7 143:21 144:5 145:4 149:6 159:18 170:8 172:5 173:15 175:10 177:21 178:10 180:16 186:12,15 189:2 189:12 190:11,19 191:8 194:9 197:9 199:10 215:3,17 thing's 75:17 think 7:4 9:12 10:5 12:20 13:12,15 15:8 16:6,10,13 16:21,22 17:17,18
T				
table 3:1 29:16 82:8 101:20 129:18 140:22 147:21 178:22 190:22 196:13 203:12,13 tackle 79:15 tailored 127:16 128:8 199:21 take 4:4 15:21 16:11 19:21 28:1 29:18 36:7 47:7 49:12 55:18 57:6 58:20 59:20 64:8 64:21 65:2 67:14 74:9 76:7 82:2 83:1 88:1 91:1 96:11 100:15 105:8 113:11 117:12 128:6 136:9 138:2 150:3 151:6 159:15 161:15 162:13 172:9 175:21				

17:20 19:6,12,18 20:4,8,14,16,20 21:2,4,7,15,22 22:2 24:1,2 26:1,5 26:15 27:2,16 28:8,9 29:8,11 30:7,12,20 31:5 34:1,6,11,14,17 34:21 35:6,13,14 35:22 36:3,10,13 36:14,19 37:8,14 37:14,17,22 38:1 38:15,22 39:4,13 40:14 43:10,22 45:10 47:12 48:3 48:9,11,22 50:15 51:4 52:9,14,20 53:4,11,14,17 54:2,5,10,13,13 63:12,13,22 64:6 64:20 65:10 66:15 66:21 67:14 69:3 69:5,7,16 70:12 71:10 72:6,14 73:14,21 74:1,2,7 74:10,16 75:18 76:1,2,6,6 77:6,13 78:1,17,22 79:8 79:16,22 81:20 82:11,14 83:6 84:5 85:1,14 86:2 86:6,11,16 87:3 87:16,17 88:1,21 89:18 92:7,21,21 93:14,22 94:22 95:9,11 96:14,15 96:18,19 97:8,9 97:12,21 102:14 103:14 104:5,15 104:15 105:12 107:15 108:3,5,22 109:12 110:7 111:11 112:22 113:10 114:2,22 114:22 115:9 116:1,9 118:6,20 119:12,13 120:3	121:5,20,22 123:4 126:1,5 127:4,5 127:18 128:10,12 129:17 130:14 131:2,9,10,14,15 131:22 132:4 133:17 134:18 139:4 141:8,11 142:5,10 143:17 143:19 144:2,6 145:2,17 150:2,19 151:2,9,10,12,14 151:17 153:16,19 153:21 154:7 155:7 156:15 157:21 160:4 167:18 169:15 172:8 173:22 174:5 176:11 178:6,8,15 179:1 179:4,15,16,18,19 180:6,11 181:1,6 182:4 183:21 185:4 188:18 189:13 190:22 191:5 192:13,19 193:9,12 194:2,4 194:22 196:2 197:8,9,17,20 198:3,6,9,13 199:3,8,9,11,17 199:20,22 200:5,5 200:8,14 201:8 202:11,12 204:10 206:2,18 212:10 212:13 214:9 215:13 216:10 thinking 7:20 14:6 29:12 35:15 112:16 116:22 121:18 148:4 181:16 200:22 201:13 205:20 thinks 38:4 87:20 147:13 third 7:21 11:22 16:4,7 19:14	43:11 44:1 55:14 62:1 166:13 thirty 47:20,22 thought 20:15 34:19 62:22 65:7 67:17 71:19 112:8 118:3 132:19 167:15,16 204:19 205:10,22 thoughtfully 113:19 thoughts 74:3 97:21 111:3 112:20 119:17 175:14 182:8 thousand 12:10 three 9:17 29:4 38:6 55:2 96:6,9 97:15 115:3 134:22 142:18 143:3 168:10,19 205:10 threw 94:9 throw 50:11 201:18 throwing 23:10 88:22 tie 67:18 tied 64:15 till 184:17 time 27:10 31:17 39:15,16 49:10 55:16 60:16 61:1 66:1 78:19 79:7 91:20 93:10 95:10 95:20 99:12 107:9 108:6,10 109:18 110:7 113:18,18 116:2 129:1 149:3 165:15 167:17 174:10 176:5 178:16 181:15,17 186:6 192:8 197:13 199:6 209:14 211:14 213:21 timeliness 180:10 timer 91:9	times 99:9 101:1 121:4 189:8,10 191:21 time's 202:13 tires 114:9 tissue 125:7 titled 169:22 today 16:20 54:18 58:9 65:20 87:10 90:10 91:19 115:14 120:18 127:13 162:7,9 172:11 179:17 195:14 206:20 209:20 210:13 214:9 216:5 today's 4:7 209:21 told 51:18 tomorrow 106:18 162:7 171:1 tonality 61:6 75:4 tone 72:10,20 74:11 142:9 tool 62:8 92:10,11 toolbox 114:21 tools 105:12 112:18 114:14 120:6 topics 201:8 totally 31:5 157:8 189:17 tougher 185:14 track 198:7 213:13 214:14 trade-off 11:12 tragedy 96:12 train 53:2 Tramont 1:13,17 3:4 4:3,11,17,19 4:19 6:10,16 7:6 13:18 14:2 16:6 17:20 19:3 20:6 21:18 22:3,11,17 22:22 23:7,11,18 25:20 26:15 29:7 30:4 33:15,22 35:20 37:10 38:18 39:17 40:11 42:9	44:7 46:22 47:10 48:7,20 52:12 53:1 54:15 55:8 55:11 56:20 57:19 57:22 59:1,10,12 59:15 60:1,6,10 60:13,22 61:13,16 63:14,17 66:14 67:20 70:18 71:2 71:6,14,16 79:10 80:6,12 81:1,13 81:19 83:1 86:17 87:1 89:21 92:15 94:20 97:17 107:8 107:14 108:17 110:14 119:17 122:20 124:9 126:17 128:18,22 129:3,10 131:21 132:2,7 133:21 134:2,10 137:8,12 140:14,17,21 142:1,10,14 143:3 145:6,14 146:11 146:14 147:5,10 147:14 148:2 149:8,12,17,21 150:2,8 152:13,22 153:12 154:3,7 156:1,19 157:1,4 159:5,11,14 160:18 161:14 163:15,21 164:2 164:14 165:21 169:4,10 170:5,12 170:21 171:14,16 171:20 173:7 196:6 197:6 198:8 198:12 201:14 202:2,7,22 203:3 203:13 207:6,11 212:13,22 214:8 214:16 215:21 216:2 transcript 208:1 transcripts 207:18 transition 91:6
---	---	--	--	--

127:18 189:7,10 translation 110:10 transparency 11:10 122:21 123:1,18 124:5 212:19 transparent 123:20 213:6 214:11 trap 97:6 travel 73:12 Treasury 121:10 tremendous 216:7 tricky 47:15,16 tried 31:9,13,15 64:20 74:16 78:6 94:3 212:18 214:18 trouble 71:21 72:12 86:18 troubled 72:20 134:12 140:7 154:12 troublesome 209:9 troubling 100:20 102:11 true 15:3 42:2 150:19 151:13 trunk 150:9 truth 14:11 200:6 try 49:2 64:10 73:14 76:8 79:16 80:13 89:21 93:20 95:7,22 107:10,10 110:19 114:10 122:7 129:14,15 135:8 136:13 137:15 143:22 151:22 167:17 177:1 180:2 181:21 187:18 191:5 197:12 201:20 213:4 trying 20:10 29:4 32:2,6 56:17 62:6 64:1 69:20 70:22 73:16 74:8 78:20 80:4,8 82:12,19	82:19 94:6 104:14 124:22 135:17 136:20 138:3 151:16 152:10 177:17 180:11 186:22 188:18 190:12 195:5 TUESDAY 1:9 tunnel 52:22 turn 7:8 8:5 110:16 171:21 173:15 175:22 177:22 179:9 182:7,12 turned 25:1 turning 193:20 turnover 104:22 turns 31:4 70:10 TV 64:5 91:6 106:6 106:16 155:5 twenty 47:20,21 twist 177:19 two 8:9 12:10 14:9 15:5,5,21 21:21 27:2 29:14 30:10 37:17 49:2 54:16 55:15 61:7 71:20 96:4,14 97:15 99:16 113:2 120:8 129:6 133:17 134:22 136:10,12 136:14 151:22 158:7 168:8 169:11 175:17 178:20 198:1 208:2 type 67:12 71:19 99:17 126:8 192:17 194:5 209:10 types 77:3 127:7 194:8 T-Mobile 2:14 <hr/> U <hr/> UK 10:17 21:12 ultimate 78:11 ultimately 25:13	124:13 185:9,19 umbrella 87:15 unable 206:22 211:15 unanswered 26:9 uncertain 193:8 unclear 18:21 undermined 32:1 underpinning 90:4 underscore 198:16 understand 24:3 25:8 56:12 61:20 62:6 78:5 98:11 176:6 177:2 187:20 191:5 200:17 understanding 24:6 25:19 42:10 100:18 110:8 understands 31:2 understood 24:16 91:22 132:10 undesignated 180:3 unfolded 64:7 unfortunately 24:4 51:11 179:8 unfulfilled 214:15 UNITED 1:1 universe 130:1 University 1:16,23 2:18 5:4 unknown 113:6 unlicensed 3:10 64:6,10,13,22 65:4,9,12,17,20 66:5,6,18 67:4,6,9 67:18 68:7 72:1,3 72:6,8,14,22 73:3 73:4,7,9,10,15,18 74:7,13,22 75:15 75:17,20,22 76:3 76:4,8,12,13,16 76:17 77:5,11,15 78:3,8,14 79:22 80:16 81:3,14 82:3,4,5,7 83:12	83:20,21 84:1,7 84:21 85:4,7,14 85:16 86:1 87:8 87:11 89:8 95:10 96:8,10 98:12 99:6,20 100:10,20 100:21 101:3,4,10 101:14,17,22 102:20 103:16 105:22 106:4,8,11 109:2,15,15,16 110:11,12,12 130:12,17,19 131:5,7 132:4,16 132:18 133:3,8,14 133:14 135:3,6,12 135:14,15 143:1 150:16 151:15,19 152:4 153:6,13,17 153:18 154:1,1,9 154:9,21,22 155:2 155:11 156:17 157:14 163:3,4,6 165:6,17,20 167:6 167:10,11,21,21 168:12,22 169:5,7 193:17 194:4,8 unlicenses 104:8 unreasonable 105:10 unused 113:4 144:4 163:10 unworkable 31:8 update 3:16 210:13 updated 10:19 upfront 31:22 upheld 214:1,6 upholding 213:12 up-front 12:6 85:19 urge 201:1 USA 2:14 usage 42:12 140:16 use 18:17,18 28:5 40:5 44:20 46:15 46:19 55:13 57:16 57:16 58:2,3 59:5	59:16,19,21 60:13 61:3,6 65:3 66:5 67:6,8,8 74:4,19 75:15,22 78:9 80:16 81:4,5 91:20 96:21 98:5 98:13 99:6,21 100:16 101:3,14 101:17,19,22 102:13 115:13 116:11 122:13 123:2 133:15 138:13 139:20 140:18 147:6,18 148:15 153:8 156:18 157:11 163:3 165:5 168:13,14,22 172:7 175:19 189:16 192:1,2 198:17 204:6 209:13 useful 39:11 48:11 77:4,12 134:18 190:20 user 41:19 42:6 43:7 92:3 101:10 139:14 140:2 users 9:22 12:5 13:1 27:21 28:3 43:14 44:4 45:7 49:12 55:6,12,18 58:12,14 59:8,13 60:2 61:5 68:4,9 73:13 96:8 98:20 117:13 135:15 136:18 145:3 149:16 163:5 189:3 user's 188:12,14 uses 41:9 46:6,11 66:6 88:4 109:5 109:16 113:15 135:12,14 153:19 163:5 167:11 193:18 utilizing 21:12
--	--	--	---	--

wish 9:15 16:3	209:20	1	31st 184:17
witnessed 41:17	worry 33:8 135:1	1 3:4	4
wondered 124:18 132:22	worse 207:20	10 3:14 105:19 154:16 161:19 187:8,8	4 3:4,10 77:8 96:17
wonderful 20:11	worth 90:15 121:16 133:9	10-year 185:7 189:11	4G 122:5
wondering 47:4 70:15	worthless 48:1	10:15 184:22	40 150:6 166:15
word 22:6 54:21 59:21 131:6,7,12 132:4 147:21	worthwhile 39:2	11 1:9 3:23	4830 1:12
wording 101:13	worthy 21:15 26:19	11:23 161:12	5
words 24:10 45:18 93:11 102:8 174:8	wouldn't 19:2 84:19 85:8 206:6	11:34 161:13	5 3:16
wordsmith 44:11	wrap 47:12 56:17 79:17 107:22 161:5	111 3:17	50 19:3
wordsmithing 134:14 179:10	wrapping 172:11	12 3:24	500 175:18 188:2 204:13
work 16:7 26:21 29:1,5 30:22 35:3 35:9 38:7 39:1 77:11 79:16 83:18 86:8 98:12 99:8 100:15 103:17 105:5 113:7 115:2 118:17 123:19 161:19 170:2 172:10 174:18 175:7,17 177:3 178:16 179:2,21 180:2 181:2 182:6 188:7 191:14 197:3,20 198:5,9 198:14 199:12 201:19 202:14,18 209:3 212:18 216:11,15	writing 83:3 166:1 180:17	12:24 216:22	6
worked 41:2 111:15 117:17 155:13,17	written 70:10 72:11 74:11	13 154:13	60 177:16
working 24:16 71:1 98:16 99:16 112:2 175:4 180:7 194:15 198:2	wrong 93:12 164:5	13th 9:5 208:4,6,17 208:19	63 3:11
works 20:20 21:7 114:12 160:2	Y	1300 188:1	7
world 74:21 94:8 94:13	year 33:7 87:21 90:17 91:3 92:4 119:13 152:11 182:20 185:21 204:1 207:9,13	1401 1:12	7 3:6
worried 160:13	years 33:2 41:2 44:12 51:19 72:16 88:1 99:6 105:6 129:7 150:6 166:15 172:12,18 173:2 175:18 185:16 189:11 191:14 195:4 198:21 210:4 216:8,9	15 33:1 161:20	700 155:12
	yeoman's 161:19 171:20	161 3:18	8
	yesterday 174:1 208:7 209:19	172 3:22	8 3:9
	yield 186:1	1755 187:22 188:4 188:4	8th 208:1,10 210:17
	York 193:3	1780 187:22 188:4 188:5	800 188:1
	young 33:12	2	9
	y'all 86:1	2 3:5 14:1 15:13 19:22 22:2 28:11	9 3:21 49:7
	Z	2.4 103:12	9th 207:21
	Zoller 2:22 6:4,4 19:11 39:18 50:22	20 33:2 48:4 118:9 177:3 187:3,6,8 187:12 188:11 189:10 191:14	9:00 1:13
		2006 12:12	9:09 4:2
		2010 1:9 208:1,4,6	900 89:16 103:8,12 103:18 146:22
		2011 207:22	97 3:15
		203 3:23	98 32:14
		216 3:24	
		24 51:8	
		25 19:5 188:2,7	
		3	
		3 3:9 28:11 156:8	
		30 44:12 88:1	
		30-year 118:9	

C E R T I F I C A T E

This is to certify that the foregoing transcript

In the matter of: Commerce Spectrum Management
Advisory Committee

Before: US Department of Commerce

Date: 01-11-11

Place: Washington, DC

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

Neal R Gross

Court Reporter

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701