UNITED STATES DEPARTMENT OF TRANSPORTATION

NATIONAL HIGHWAY TRANSPORTATION SAFETY ADMINISTRATION

ITS PROGRAM ADVISORY COMMITTEE

MEETING

THURSDAY
AUGUST 8, 2013

The Committee met in Salon F of the Crystal City Marriott at Reagan National Airport, Arlington, Virginia, at 8:00 a.m., Bob Denaro, Chairman, presiding.
PRESENT

BOB DENARO, Chairman
PROF. HANS KLEIN, Vice Chairman
STEVE ALBERT
SCOTT BELCHER
ROGER BERG
JOSEPH A. CALABRESE
JOHN CAPP
PAULA HAMMOND, P.E.
STEVE KENNER
RONALD F. KIRBY
J. PETER KISSINGER
SCOTT J. MCCORMICK
RAJ RAJKUMAR (via telephone)
BRIAN SCHROMSKY
TON STEENMAN
GEORGE T. WEBB, P.E.

ALSO PRESENT

STEPHEN GLASSCOCK, Designated Federal Officer
CARL ANDERSEN
SHEILA ANDREWS
JIM ARNOLD
SCOTT BELCHER
DANIELLE COFFEY
BRIAN CRONIN
MARJORIE DICKMAN
DOMINIE GARCIA
KEN LEONARD
VIRGINIA MEEHAN
STEVE SILL
BRIAN SCARPPELLI
KARISSA WRIGHT
SKIP YEAKEL
## C-O-N-T-E-N-T-S

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(8:04 a.m.)

VICE CHAIRMAN KLEIN: Okay, ladies and gentlemen, we will get started now. We are in Day 2 of quite possibly our penultimate meeting. We have the last meeting later this year but we are winding in towards our deliverable, which making recommendations, a recommendations report. To do the recommendations report, we have to -- the individual subcommittees have to make their recommendations. So that is our focus for today is individual subcommittees convening and making their individual subcommittee recommendation summaries. And then we do that from this morning until lunch time.

We are going to start off with subcommittee breakouts. And in a minute we will tell you where our rooms are. So there are five different tables in three different rooms away from here. And we will meet there
from 8:30 to 10:00 this morning. And then we will come back here and meet as a group for another hour and a half or so and present the subcommittee reports. And they will be presented in turn to the full committee.

That is, we have 90 minutes for the presentations. So that will possibly be a little tight there. We will see how that goes. We will see how much discussion we have there.

We are going to break for lunch. After lunch, Bob will be leading us again more on the discussion of the final recommendations, the consolidated final recommendations to the Secretary, which is both a discussion of the process and discussion of the final recommendations, as well as some next steps that are coming on that.

So I am going to talk a little more about some of the logistics of our breakouts and then, Bob, if you want to say a
word on that.

There are five subcommittee groups and they are Communications, Deployment and Implementation, Technology, Standards, and Security. For logistical purposes, would, I guess it would be, the subcommittee chair raise their hand for Communications, so the people on the Communications Committee know who to follow?

Members of the Communications Committee raise your hands just for a second. Let's do it that way.

CHAIRMAN DENARO: Kirk is the head of that and he, wisely, decided not to attend.

VICE CHAIRMAN KLEIN: Okay folks, follow Paula. We are going to do that, okay? Paula, you are the head.

MEMBER HAMMOND: Okay.

VICE CHAIRMAN KLEIN: The Deployment Implementation Subcommittee, raise your hand. One, two, three. You know Steve
and John, you guys are welcome to join because we didn't meet as a group last time but I know I think you are also on other committees. Okay, so I will figure out where we are sitting. Maybe I will look and try to put us in the same room so if you guys want to come join us for a while that would work.

Technology Committee, raise your hands.

CHAIRMAN DENARO: That's me.

VICE CHAIRMAN KLEIN: Chairing it, Roger --

CHAIRMAN DENARO: Probably it is because we have some people with dual citizenship.

VICE CHAIRMAN KLEIN: Yes, right.

CHAIRMAN DENARO: And they favor the other one than my subcommittee.

(Laughter.)

VICE CHAIRMAN KLEIN: I'm sorry.

CHAIRMAN DENARO: But I happen to agree with
that. So you guys should go, Ton and Scott and Raj is not here. So he is the other one.

VICE CHAIRMAN KLEIN: Okay.

CHAIRMAN DENARO: So Roger and I will make all the decisions.

MEMBER ALBERT: Ton --

CHAIRMAN DENARO: Oh, are you going to join us?

MEMBER ALBERT: No, I was going to suggest something. You know given many times implementation is predicated on communication with the other group. I wonder if the two groups might make more sense to combine for this meeting.

VICE CHAIRMAN KLEIN: There is going -- it is like a Venn diagram. I suggest that we meet in the same room. One of the things about this is the implementation is a cross-cutting issue. So it has a lot to do with the other ones.

CHAIRMAN DENARO: One of the rooms we have has three round tables in it.
So if you both go in that room, then -- yes.

MEMBER McCORMICK:  Security needs the room with a phone and a beamer.

CHAIRMAN DENARO:  That's true.

VICE CHAIRMAN KLEIN:  Needs a phone and a what?

CHAIRMAN DENARO:  A projector.

MR. GLASSCOCK:  Yes, Scott's committee has to be staying here because of the phone.

VICE CHAIRMAN KLEIN:  Oh. So you guys are staying here. So does that mean we possibly have an extra room?

MR. GLASSCOCK:  Yes.

VICE CHAIRMAN KLEIN:  Thank you.


And Security Subcommittee. Okay, Brian.

So let's put -- the Roosevelt Room has three tables. So the Communications
group will meet there, the Deployment and Implementation and the Standards. We will put all three in those three tables. Is that okay?

MR. BELCHER: No. Well, I --

VICE CHAIRMAN KLEIN: You also need a phone?

MR. BELCHER: Well I have got a phone. I can just use my cell phone but I do have people calling in.

CHAIRMAN DENARO: So we have two other rooms.

MR. BELCHER: Okay.

CHAIRMAN DENARO: There is actually the small glass room, the glass table.

VICE CHAIRMAN KLEIN: Is your concern about just quiet?

MR. BELCHER: Yes.

VICE CHAIRMAN KLEIN: Noise, okay.

MR. BELCHER: Yes, because they
will be on speaker phone.

VICE CHAIRMAN KLEIN: Okay, then adjoining to the Business Center is another room.

CHAIRMAN DENARO: It has four chairs. Do you need more than four chairs?

MR. BELCHER: Steve, John -- no, four works.

CHAIRMAN DENARO: Okay.

VICE CHAIRMAN KLEIN: Okay and hopefully cell phone reception is okay.

CHAIRMAN DENARO: It is a glassed-in room. So that is a good room for you guys.

VICE CHAIRMAN KLEIN: Okay and so Security is going to be meeting here. And Bob, where would you like to meet?

CHAIRMAN DENARO: We will go to the bar.

VICE CHAIRMAN KLEIN: To the bar.

(Laughter.)

CHAIRMAN DENARO: I'm only half
kidding. It is a little bar over by the athletic facility. So we will go in there. A little cubby hole in there.

VICE CHAIRMAN KLEIN: Okay. Now I know that some committees, your subcommittee has already a draft write-up. Are we looking for a deliverable of actual draft language?

CHAIRMAN DENARO: I would prefer that people -- somebody had a computer in the group and yes, draft language and we will put it up there. And we can all stare and take shots at it.

VICE CHAIRMAN KLEIN: That is all right. Okay, so there is a target. The aspirational target is to actually have a draft of a memo. I saw yours was about a page, a little less than a page.

CHAIRMAN DENARO: Well of each recommendation. Yes, I am going to show that.

VICE CHAIRMAN KLEIN: Okay, very
Okay then, that is the logistics for our breakouts. And if you want to show your example and then talk about the afternoon, I will pass it to you.

CHAIRMAN DENARO: Yes, okay. Let me just say a couple of comments about what I would like to see and I hope you agree. First of all, this probably doesn't need saying but I think we need quality not quantity. Okay? We don't need a memo with 42 recommendations in it. I mean if we have meaty recommendations of that number, that is fine but that is not what we need. And in seeking quality, remember how we started when we first started two years ago the thing I said was let's think about things that could be serious inhibitors to deployment and realization of ITS. But of course we are focusing very much on Car 2 Car Communication. So what might delay or block that may be the JPO needs a little more work.
We don't need to state things that we know they are already handling. Obviously, it is our job to find where the gaps in what they are doing, where there might be a slightly different direction or something like that. So I hope we are all on the same page with that.

We have done some work over the past nearly two years. You have got notes on what we have done. Hopefully you draw from that information and you have already got some things in mind. If you invent some new ones in the room, I think that is fine and that is great. It will come here in front of the group.

And again, the idea is each subcommittee will bring its recommendations and then we will discuss it as a group. As a group we can decide not to go forward with one of the recommendations for some reason we can decide to modify it, which I suspect will happen quite often. And we can even, as a
group this afternoon, come up with some others. You know maybe some that is up there makes us thing of something else. All of that is okay.

What I would like to see by the time we leave here is a straw man list. Maybe it is not all wordsmithed the way we want it and everything else but we have kind of a got a handle. And most importantly, we have got fairly good consensus on what is up there. Because we do have everyone signing up to whatever recommendations we go forward with. And it is going to be a lot easier to get consensus while we are here in the room than it is over the email. I think you know that. Okay?

So with that, I am going to give an example of a recommendation. It is a format that we used in the last one, which I think was pretty effective. So I would recommend that we follow that same kind of format and if anybody disagrees and has a
better idea, that is fine.

So here's an example from the last memo. And it has two pieces. It has this little preamble piece that has recommendations. So I will just give you a minute to read that.

(Pause.)

CHAIRMAN DENARO: So you can see that if you use a little preamble to say this is the reason or the background behind why we are making this recommendation. And then there are maybe just one or multiple recommendations. And that means there is a lot of flexibility with how many preambles we put in there.

Now that said in the previous committee there was one subcommittee, as we have here, who chose not to do any preambles. So that is okay but I just think it helps for understanding because again, we are trying to communicate to the JPO and everyone else who is going to read that what our
Okay, any questions or comments on that?

MEMBER CALABRESE: That preamble is on top of --

CHAIRMAN DENARO: No. There is going to be a number of preambles that can -- maybe one for each recommendation or maybe some of the recommendations group, as they did in this case.

So just to be clear, my suggestion is that each breakout team in coming up with their recommendations generate one or more preambles to describe their recommendations, their background for the recommendations. Okay? Great.

VICE CHAIRMAN KLEIN: And I want to say also all previous ITS PACs final recommendations are on the web. So there is more examples of the kind of stuff we can be producing. And it has been my experience if you Google on I-T-S space PAC, you get very
quickly to the right page and you will scroll
down that page and then find the stuff.

MR. LEONARD: ITSPAC, it is one
word. And it is the web page that has the
reference documents. It has the last six or
seven years reports to Congress, advice
memorandum, several dozen reference
documents.

VICE CHAIRMAN KLEIN: That
assumes you are getting wireless in here,
which I am not. Do we have wireless? My
room wireless is not allowing me to connect.
This is a different conference.

So if anybody wants wireless, I
am going to read out -- on the right-hand
side and it is leading with a zero? Okay,
excellent. So that will --

MR. LEONARD: But it is maxed at
12 people.

VICE CHAIRMAN KLEIN: Hurry up,
people. The first one gets there.

CHAIRMAN DENARO: Is that a one?
MEMBER McCORMICK: I was wondering if it is counting some people's phones.

CHAIRMAN DENARO: Well I can turn off my Wi-Fi on my phone.

MR. LEONARD: We can add more. So if there are more than 12 people, we can add more.

VICE CHAIRMAN KLEIN: Very good. Then, without further ado, we will break and we will be back here -- there is a break at 10:00 and then we resume here at 10:20.

(Whereupon, the foregoing proceeding went off the record at 8:18 a.m. and went back on the record at 10:26 a.m.)

SUBCOMMITTEE REPORTS ON RECOMMENDATIONS TO THE SECRETARY OF TRANSPORTATION

VICE CHAIRMAN KLEIN: Okay, we are all back. We have lots of good ideas. Now we have about an hour and a half for the five groups to present their recommendations to the universal acclaim and admiration of
their colleagues, I have no doubt about that. But in any case of discussion, review, possible suggestions, feedback, et cetera.

CHAIRMAN DENARO: Actually we have the rest of the day. So we have a session right now, a report out. But all afternoon, this is all we are going to talk about.

VICE CHAIRMAN KLEIN: Okay. Yes, because we are going into the final recommendations, which is essentially what we are doing. Okay, so I feel a little better about that because 90 minutes seems awfully short.

CHAIRMAN DENARO: It is.

VICE CHAIRMAN KLEIN: Okay, then let's pow-wow for a second here. We have got 90 minutes, which are subcommittee reports on recommendations. The discussion of final recommendations, do you see that as significantly separate from subcommittee report-out?
CHAIRMAN DENARO: No, it's all the same.

VICE CHAIRMAN KLEIN: Report outs go until after lunch.

CHAIRMAN DENARO: Correct. So I think we go subcommittee-by-subcommittee and my recommendation is we deal --

VICE CHAIRMAN KLEIN: We will have more time.

CHAIRMAN DENARO: -- with each subcommittee until we are finished with them. And then we will go with the next one. So if we do all the subcommittee report outs and finish everything before lunch, we all go home. But somehow I suspect that is not going to be the case. So we will do one at a time and then this afternoon, we will likely get into more of the subcommittees and so forth until we work our way through this.

VICE CHAIRMAN KLEIN: Thanks.

CHAIRMAN DENARO: So again, the name of the game is have the subcommittees
get up, show their draft preambles and recommendations. I really want to encourage everyone to weigh in if you have concerns everywhere from we don't agree with that recommendation to just some wordsmithing, whatever and work our way through that. I am not too worried about final, final version of the recommendations because we will pull all of this together, Hans and I will pull all of this together in one document, get that all back to you via email for review and we can spend our time wordsmithing at that time.

So I think what is really important here is to get the macro issues. Did we miss something? Do we not agree with something the way it has been done? Did we take the wrong approach on some recommendation? Whatever. That is something as a committee because again, we need consensus at the end of this. So it is kind of like the more input we get more and the more agreement we get now, the easier it is
going to be on all of us to get this done in
e-mails.

All right? Any questions on
that? Any other suggestions, a better way to
do this?

All righty. I believe -

STANDARDS SUBCOMMITTEE REPORT

VICE CHAIRMAN KLEIN: We will
start with Standards --

CHAIRMAN DENARO: -- Standards is
starting first.

Oh yes, let me just take a poll.
We are scheduled to go to 4:00 today. Is
there anyone -- I know Steve has to leave
eyearly. Anyone else -- or actually just leave
for a phone call?

MEMBER KENNER: After I report
out, I just have to do a call is all and then
I will be back.

CHAIRMAN DENARO: Okay. Does
anyone have to leave early? Three? You can
leave here at 3:00.
MEMBER HAMMOND: I have to leave at 1:00.

CHAIRMAN DENARO: At 1:00, okay. So let's make sure -- we will do yours now so you can do your call. And then let's move to Paula's committee since she has to leave at 1:00. We'll go in that order. Okay.

MEMBER KENNER: All right. So what we did is we had to graph the standards harmonization information from the 2011 report and then we were trying to go through the process of updating it. We didn't finish all the wordsmithing but we went through a fair amount. And then we have some other ones that we want to include at the very end that were never really addressed. And then there is a relationship between the technology section that we want to also discuss because we think there are some standards of open platform stuff in technologies that we want to make sure -- it doesn't have to be in this section but we
want to make sure it is still included because we think it is important.

CHAIRMAN DENARO: Okay.

Distinction of sections in our final memo is not important.

MEMBER KENNER: Right.

CHAIRMAN DENARO: It is just for readability, really.

MEMBER KENNER: Yes.

CHAIRMAN DENARO: We are not going to call out, necessarily, separate sections in it. We are just going to go item by item and so forth.

MEMBER KENNER: Yes.

CHAIRMAN DENARO: And we just need to figure an order that makes it readable.

MEMBER KENNER: Yes, agreed.

So anyway, so if you look through what we have here, we are basically saying that we want to be able to provide recommendations to make sure standards are
harmonized globally that will help promote
efficient and rapid deployment of ITS
technologies and control the cost and
complexity of maintaining those standards.
And then we basically say it is important for
a fast deployment we need to be able to be
able to make sure that we take quick action
to minimize the development of standards that
are inconsistent with harmonization. There
have been progress in the U.S. making some
agreements with Europe, Japan, and Korea to
acknowledge the benefits of it. And then
there is a whole bunch of groups working. We
are basically just summarizing the broad
categories of those groups.

We also say continued strong
direction and leadership to encourage
harmonization is encouraged and if not,
future standards will not likely be
harmonized to provide public benefit. We say
harmonization can be beneficial if it allows
for common hardware and software modules to
be used in multiple regions but they don't have to be identical for there to be a benefit.

And then one of the more disappointing things is we basically said the following obstacles are identified for globally harmonized standards and really all those obstacles existed two years ago. They exist still today.

Competition amongst standardizations, the European government and automotive industry that are continuing to drive short completion timing with voluntary resources from Europe manufacturers, financial support from the EU on the standards development. You know some of you know that standards may even be coming out in '15. The lack of forms to harmonize the standards, incompatibilities between countries, and then lack of agreement among vehicle manufacturers and government concerning the scope and timing of
harmonization.

And then I will go a little further down here. So then there is some specific recommendations. We modified some, we eliminated, and then we have some that we want to add at the end.

Here we say this is like the lead-in statement. And we can just consolidate the lead-in statement and the recommendations. It seems like there is some level of redundancy there. But we are recommending here that the ITS JPO should make and reinforce a clear public statement that harmonized ITS standards are critical to the efficient and rapid deployment, similar statements from the RITA administrator, the U.S. DOT Secretary and Secretary of Commerce would add important emphasis.

And while we made some statements in the past, clear single-purpose statements and reinforcement from higher levels within U.S. DOT would be of substantial value.
So it is interesting. We were talking about the standards and maybe the emphasis to this, even in advance of looking at this, and we had actually written down something substantially similar to this. So we think that that is very important. And at the higher levels, maybe not being done as much today.

The second recommendation is that the JPO should continue to adequately fund appropriate organizations to involve the U.S. experts and develop harmonized standards and apply appropriate pressure to the standards organizations as appropriate.

If you look at the specifics of the recommendation, we just say it should play a more visible leading role in encouraging the development of harmonized standards by continuing to adequately fund organizations dedicated to and programs designed to result in harmonized standards. We think a lot of this is still there -- I
mean the need is still there and should make a commitment to adequately assure funding in future years, reinforcing the commitment and to make sure that sufficient U.S. Government staff are involved and encourage vehicle manufacturing participation in the appropriate international standardization forms.

And implied in that is the travel for government employees as well. That has become increasingly challenging. And so we think we need to continue to enforce -- face-to-face meetings are critical. You are not going to be able to call in a WebEx and an audio and really be able to contribute to and benefit from that discussion.

MEMBER BERG: I have a question, Steve.

MEMBER KENNER: Yes?

MEMBER BERG: Listed in this is the reason that the government needs to be involved, as opposed to industry-based
standards. Is it because of the global harmonization?

MEMBER KENNER: Yes.

MEMBER BERG: Did you state that in the intro?

MEMBER KENNER: So here we say other regions are invested at the political level and the U.S. Government should be as well. I didn't read that but --

MEMBER BERG: Okay.

MEMBER KENNER: -- yes, indeed.

MEMBER BERG: Okay, great.

MEMBER KENNER: We are the only ones that don't do that.

MEMBER WEBB: Can you tell us -- DOT?

MEMBER KENNER: Pardon me?

MEMBER WEBB: You say the JPO on the 17th but I am just saying should it be DOT?

MEMBER McCORMICK: Yes. Whether it is JPO or federal highway really depends
on the area.

I would like to add something that I know Steve has been hearing me say for five or six years now. One of the things that is absolutely needed is a comprehensive gap analysis of what standards exist because you are dealing with not only automotive but communication networking and computation. And with the work that I have done with the TIA and the ITU, there is a number of standards that may be able to be adopted or adapted, rather than looking at what we have to create new.

And until we have done that gap analysis, we really don't know whether or not there is an area out there that has already been covered for which there is very little work that needs to be done. That would be appropriate to space because all of those pieces are now part of the ecosystem. They may not be relevant to automotive but they may be relevant to the communications side or
to the networking side. And unless we have an understanding of what exists in what region, and by what organization, I think we might end up duplicating work that has already been done or creating something that is contrary or what may be a globally understood standard now.

MEMBER SCHROMSKY: Well just what I have on the communications, one of the things we see there is a 3G PV2 association which is made up the Chinese, North America, Japanese, and South Koreans. And they basically set the standards for third and fourth generation networks. So chips and everything else can work. Because one of your technical hurdles is communications but the DSRC can run on multiple frequencies. You just need a multi-chip in there.

Certainly DSRC is the standard. So we might use 5.9 here. Another country can use a different frequency.

But to your point Scott, there
are consortiums that address this, at least for the communication, that are made up I would say of South Korea, Japan, China, North America, which I think is the majority of the manufacturers.

MEMBER McCORMICK: Well I am just saying we can expand this beyond just the automotive space that it is appropriate, given that they are all part of the ecosystem, future ecosystem.

MEMBER BERG: Are you then recommending those communications as part of the VX safety system?

MEMBER McCORMICK: No, what I am recommending is that if we are looking at harmonizing and understanding standards, that the standards that may be effective, that may be utilized is an implementation across the ecosystem are not just automotive. And so we ought to be aware of whether or not there is communication, computation, whatever these standards out there that have relevance to
our space that we can identify.

The purpose of having standards is two-fold. It takes all the things that are non-differentiating or producing companies and says let's not create expertise around that. Let's commonize on how to do it so that we can become more efficient across the world.

MR. BELCHER: So I think we do have that recommendation in there. Don't we, Steve? Or did we take it out? Did we take out the recommendation to do the gap analysis?

MR. SILL: No, I think it is in there about identify and prioritize and it is certainly part of our gray moment here in union and part of our program by going forward anyway.

MEMBER KENNER: Yes, so if we go right to that part, let's go to the -- it says a right of international and regional standards organizations are developing
standards that will impact the ability to efficiently and effectively implement V2X. Absent strong leadership and commitment, the standards will be developed regionally and result in inefficiencies and costly duplication of efforts, delaying deployment.

The U.S. Government should play a role in supporting identification and prioritization of key standards and support harmonization of those standards, work with Europe and Japan, as well as seek to engage with other major and emerging markets. Support for core V2X standards is critical to the success. Support for a broader range of ITS standards is also critical, considering the breadth of V2X and the need to send a clear message to standards organizations that they need to work together to develop a full range.

But it doesn't specifically here in the recommendation then -- it does say develop and prioritize a list that should be
shared and that the progress should be tracked through standards organizations. But I don't think it specifically says gap.

MEMBER McCORMICK: If you go to the first sentence, if you take out the word ITS --

MEMBER KENNER: Which sentence?

MEMBER McCORMICK: The very first sentence, which says presently -- up a little bit more. The paragraph above.

It says presently a variety of international regional standards organizations are developing standards that will impact, not just like the S Standards. The telecommunication, all the other industries, they are developing standards and they are going to impact the space.

My point isn't just that but that somehow the DOT should be aware of what those are and ensure their understanding that they are not going off and saying we need to create a standard when it already may exist
or the framework may exist.

    MEMBER SCHROMSKY: There might be

    forums different IPP-6.

    MEMBER BERG: As long as we keep

    that prioritization in there. Because I

    still can tell you it is hard enough to get

    car makers to agree on anything. And even

    car makers from different regions to agree on

    anything when they are the same company.

    So to add more CTIA and all that

    stuff is just going to, I think --

    MEMBER McCormick: Yes, I am not

    saying we need to involve them. I am saying

    we need to -- again, it just says do we know

    where standards exist in a fixed space. Okay?

    We are not saying we necessarily need

    to involve them but we need an awareness of

    that. That is the purpose of gap analysis is

    to know what you really do have to compare to

    complete.

    MEMBER BERG: So once you are

    aware of that, what is the action after that?
MEMBER McCORMICK: Well they would know whether or not you actually have a vehicle by which to commonize or standardize that activity. Okay? I mean that was the problem --

MEMBER BERG: So you use the additional complexity of others recommending against it.

MEMBER McCORMICK: Well let me lift the skirts a little bit.

At least three times a year, an OEM or a Tier 1 calls me up and says I think we need a standard around this. I do a little bit of research and I say, do you realize TIA already has that? Will that work? Did you look at that one? No, we are not aware of that.

And so for at least since -- well since then, at least, have been saying the first thing you have to do is a gap analysis. Know what work you really have in front of you. Do we really have to complete all these
standards or are there bodies of work that have been done and are already standardized that says oh, by the way, you will use this specification, not just from IEEE or SAE but you might have a requirement to use this one from ITU or one of the other telecommunications or networking or communication.

I am just saying that there is never, to my knowledge, that an adequate gap analysis that says let's look at the entire ecosystem of what is involved, not just the car, not just communicating to the SRC because once you get off the SRC, it goes back to the infrastructure, back to the land lines and the other wireless profiles. There may be something there that is contrary to what you want to do but we just don't know. There could be something there that is going to be advantageous for us. And until somebody actually sits down and does a gap analysis, that says I know for these elements
of the ecosystem of what we are going to try
to accomplish, standards already exist or
don't exist and will quickly identify where
there is near-term work that needs to be done
outside the myopia of looking at just what an
auto industry does.

MEMBER STEENMAN: And it is
particularly important, given that we frame
these as V2X. V2X is much beyond just DSRC.
There is a lot of other communication and
connectivity capabilities that are involved.
And I thoroughly agree there is a lot of
stuff out there already.

MEMBER McCORMICK: Just as a
suggestion, I'm not saying you have to put it
in. I'm just suggesting that a gap analysis
--

MEMBER SCHROMSKY: My only
analysis, I just wrote down the technical
challenge of identifying if there is multiple
standards in terms of communicating. So I
can take this anywhere in the world and it
works, right?

MEMBER BERG: Yes, after 20 years of messing around.

MEMBER SCHROMSKY: Exactly but the radio has already been established. So you can take something that has already been established and look at it and say hey, this has already been there.

So I am not saying to your point, I am trying to get everybody to agree but there has already been establishment for multiple communication parameters.

MEMBER BERG: And I understand that, as long as it in the right priority. But TIA didn't do that with the first 100,000 cell phones. You couldn't go from Norway to Sweden and have the phone work.

MEMBER SCHROMSKY: Exactly.

MEMBER BERG: So what I am saying is let's not over-complexify, if that is a word --

MEMBER SCHROMSKY: It is now.
MEMBER BERG: -- and try to do all this stuff beforehand. I mean it is an evolutionary process. So that is why I want to emphasize the point about prioritization.

Figure out how to harmonize with your use cases that you are going to do today. And obviously, like Scott said, be aware of what is coming in the future but don't hamper progress on the prioritizing list by trying to make things overly complex.

As long as we keep that prioritization in there, I am fine.

MEMBER KENNER: So the one question is, is a gap analysis an incremental recommendation or part of this recommendation?

MEMBER MCCORMICK: I would have to defer to your committee, to Scott's committee to decide whether or not that is relevant or not. I am saying it is a needed step.

I run a standards organization.
One of the things he may have to do is sit down and go we looked at 24 different world standard organization, created actually a body for us to communicate. He said tell me what you have that is going to affect this space. That allowed us very quickly to identify the areas that we did need to work on and the items that we could just adapt. To me it is an efficiency thing.

MR. BELCHER: So it is a separate recommendation.

MEMBER McCORMICK: If it needs to be separate, that's fine.

MEMBER KENNER: Okay, no problem.

MR. LEONARD: Can I just ask a clarifying question, Steve?

MEMBER KENNER: Yes.

MR. LEONARD: Is the intent to limit this to V2X but not other ITS areas that might have standards? And is the idea to limit this only to emerging and future technologies and not the maintenance of
existing standards that underlie a lot of existing work? Because there is a maintenance aspect when it comes to standards as well.

MEMBER KENNER: Right.

MR. LEONARD: So was the intent to limit this in those ways?

CHAIRMAN DENARO: Let me just add a general comment. I don't think we are too worried about making sure we cover the entire landscape of standards. So our recommendations will be kind of cherry-picking. Gee, here is one area where we are concerned and that what we end up not saying doesn't mean it is not important. It is just --

MEMBER McCORMICK: The other thing is, all of that -- let's talk about the furnishings. You know, the single phase and timing aspect. What goes on here is different than what goes on in Europe, as what goes on in Asia. And it is not
necessarily a world market that these entities are trying to sell this other ITS equipment globally. The ones that are doing it reasonably because you can't dial 911 in China, for example. There is no infrastructure that supports that like there is here, no PSAP. So I think it is a valid point.

But the other issue is that I think if we say one of the limited resources of the DOT ought to be applied, this is of immediate concern.

MEMBER BERG: That's why I say prioritization.

CHAIRMAN DENARO: We don't have the ability to be comprehensive. We would have to meet every week for years to cover the landscape. So by our nature, we can only cherry pick and we are trying to prioritize but our prioritization may not be completely accurate but that is our --

MEMBER McCORMICK: It is not
holistic. We are not trying to solve world hunger, we're just trying to get Roger fat.

MEMBER KENNER: But the other -- and so but Ken, getting back to I think what you were asking. We were not doing this from the perspective of taking every existing standard and getting people to agree to then take existing standards and merge them into now the one new one. It was for in the creation of standards that we think are required in order to do this. Let's make sure that in the creation process you harmonize. Because quite frankly, once they are created, getting everyone to agree is very challenging for sure. So that was really the spirit of what we were talking about there.

Now to the extent that you are going to create something that already exists, well I agree with that. We shouldn't do that. And if there is a lack of awareness you certainly when you are going through the
process of creating one, you ought to make
sure that you understand what is out there
today. I think that makes a lot of sense.

But the spirit of it was sort of the harmonization of creation of new standards and make sure that happens. And the wording we have there is the risk of -- because if they get created and they are not harmonized in the creation process, then Polk's creation trying to harmonize them is very challenging.

CHAIRMAN DENARO: Steve, do I understand that you are taking a lot of previous recommendations and repeating them here?

MEMBER KENNER: Yes. So we are trying to bring those up to date with what we think has evolved.

CHAIRMAN DENARO: Okay.

MEMBER KENNER: And where they have the preamble and recommendation, we will maybe be a little more economical in wording.
I think it was a bit wordy.

CHAIRMAN DENARO: Yes, okay.

MEMBER KENNER: But yes. And then at the end here you will see I have a number of ones that I want to at least discuss with the group because there are a few places where we wanted to avoid, let's say sculpt but still maybe address a couple of items as well.

CHAIRMAN DENARO: Okay. So my question revolves around -- I completely agree with what you said that we are taking the previous recommendations. We are bringing them up to date because there is still some work to do and so we update it. But I am just throwing this out for discussion. Just my opinion, I guess, is I don't feel the need to repeat something just because we feel nothing was done about it. Does that make sense?

MEMBER McCORMICK: I disagree.

CHAIRMAN DENARO: I think if it
is not done I think it is important not only to us but the previous people. I think it is valid.

MR. BELCHER: We went at it two ways. We started out we made a list of the things that we thought were important, that we thought the advice could help U.S. DOT inform its decisions in the standards process. And we wrote down four areas that we wanted to do.

So we did that initially. Then we went back and looked at what we did in 2011. Low and behold they were the same issues.

And so one of the things that we have done is where progress has been made, we recognize that. We recognize that progress has been made but --

CHAIRMAN DENARO: There is still work to be done.

MR. BELCHER: There is still work to be done. I mean so if you talk about when
one of the major recommendations is the need to elevate the standards discussion within the Department beyond the JPO and engage politico, political, because that is what happens with accounting-wise. And it may be at the Department of Commerce, it may be at the White House, it may be within the Department. That is something that we feel very strongly about -- felt very strongly about and would be beneficial to the process.

And so we want to continue to urge that.

And so I think what you see here is that well, these things were -- some of these things were stated before. They are as relevant or more relevant today than they were two years ago.

CHAIRMAN DENARO: Okay. Is everybody comfortable with that?

(Chorus of yes.)

CHAIRMAN DENARO: Okay.

MEMBER KENNER: We had a little of that dialogue and we internally expressed
the same concern and pretty emphatically wanted to go in this direction.

MEMBER McCORMICK: I have one other question. Given that some of them were extensions off of the previous one, the Department's response to those -- are we expecting a different response now?

That's the definition of insanity you know. Keep doing the same thing and getting a different answer.

MR. BELCHER: That's a fair question. We didn't talk about that.

MEMBER McCORMICK: I was actually just saying so can we hear them? It makes their work easier.

MEMBER KENNER: So we mentioned about the funding. So let me go -- there was another recommendation, just to give you an example, where they talked about doing the --

CHAIRMAN DENARO: Excuse me, Steve. Can you zoom by maybe 120 or 130 percent?
MEMBER KENNER: So then here there was one where they had talked about you should do an analysis of cost benefits. And we crossed that out. That was one where we said first of all, we think people recognize that there is -- Jim Vondale, my predecessor, had done a presentation a couple of years ago that did macro quantification that I was going to get back out to share with everyone because not everyone has maybe seen that. And then I have got to look. I think I have actually made some public statements as well but I have got to look because it was like a year and a half ago. And really for the broader industry we, at Ford, made an estimate to say that we think that it represents like billions of dollars. It is huge.

And you know if you take across our entire fleet and then if you extend it to all the automakers and then go to different regions, it is a huge, huge issue for us.
Otherwise, we wouldn't be spending the time and energy on it.

So anyway, because that kind of went through there and we didn't think that was another incremental recommendation and wouldn't recommend having the DOT spend time and energy on that.

So then the next one is one -- we didn't economize it yet but one of the things in this next recommendation was that there should be face-to-face meetings more frequently and for longer periods of time. There is other things in here about the collaboration that we think may be aren't as applicable but we do think that that is as relevant today as it ever was. And so we want to be able to continue encouraging that because we think it is really important. And where we started doing that, we have actually made some progress.

So in the last two years, has progress been made there? Yes. When and how
was it made? It was made because that happened. Are we now consistently doing that? Well not as much as we think. So it gets back to we think that it is really, really important. So we recognize that progress was made but boy, oh, boy, we are seeing maybe a reverse trend where now people are saying maybe it is harder to get the international travel or to spend the time and energy associated with having those face-to-face longer meetings. But there are examples where that was really an effective thing to do and we want to --

CHAIRMAN DENARO: So should we explicitly say -- and for reference I don't have an opinion on the answer to this -- but should we explicitly say in the light of challenging travel budgets, even internationally, that we recommend priority be given to this area because it is critically important?

Although, it is not our position
to comment on budgets and things like that.

MEMBER KENNER: Well we had a little debate about how specific to get, quite frankly, and so we kept it a little more general with that as advice.

MEMBER CAPP: Just to emphasize that it is important.

MEMBER KENNER: Right.

MEMBER McCORMICK: Where it says on the second sentence to the last paragraph, it says absent strong leadership and commitment. My preference is always to make that more positively proactive and say with strong leadership and commitment, you can achieve this thing, rather than tell them what the disaster is.

And then say will result in efficiencies and reduce cost and duplication.

MEMBER KENNER: So we can do that. We can certainly add the positive.

MEMBER McCORMICK: Do we define what the core V2X standards are? Because it
MEMBER KENNER: So here is the recommendation. Because we kind of jumped to this one when you brought up the previous point and this was the one where we are really emphasizing the prioritization to say we need a prioritized list that everyone agrees to.

Now has there been progress on that? Yes. Has there been sort of an initial draft? Yes. Is it a formal consolidated agreed to list? Not yet. And so that is one we have got to push across the finish line.

The feedback we got from Steve -- where is Steve -- is that we are heading towards maybe publication of that at the beginning of next year. Is that accurate?

MR. SILL: Yes, let me just back up to the question about the implicit what are the cores standards. I think it was presumed to be implicit but when this was
originally written, the core standards were the set required to enable the over the air communication from V2B. That is IEEE 1609, IEEE 802.11b and SAE J2735.

MEMBER KENNER: So that part, we will reword this to make sure it is clear. And then also to include maybe a better explanation of the development of the new standards and then when developing a new standard, you should make sure that you have an analysis of what are the existing standards that are affecting the thing that you are working on in creation of a new one, as you said earlier. So I think that makes sense.

So then the next one I have listed down there is we had talked about this a bit yesterday and we are wanting to make sure that we don't sort of ignore but don't get overly distracted, given that we are trying to finish this up.

So we say the next program
advisory committee should consider the relationship between V2X standards and potential emerging standards for -- oh, I didn't have the right typing all there -- for emerging technology including communications, machine to machine and automated autonomous vehicles.

And then I would also, the presentation was made yesterday that said connected vehicles or vehicle to vehicle communications will make autonomy better. You know, a word like that or a sentence like that because I think that is spot on. I think not only are these things all happening in the same time frame so if you look at the next six to ten years, these things are coming on a course that is on a similar time line.

MEMBER McCORMICK: Collision course.

MEMBER KENNER: Yes.

MEMBER McCORMICK: So I have a
question. Would that be -- this is for Bob. Would those things in red, since it is for what the next IT effect, is that appropriate in this document or should that be a letter to the chairman to put in his secret box to pass?

CHAIRMAN DENARO: I was just going to ask that question actually. Why would we want to make recommendations for the future ITS PAC. I think the purpose is you know this is going to the Secretary and so forth. So why are we talking to ourselves in a letter to him?

And furthermore, if these are considerations for the next ITS PAC, why aren't they considerations for the JPO itself? So why shouldn't the JPO consider a relationship between V2X standards, and potential emerging yaddah, yaddah?

MR. BELCHER: We wanted to punt and not write it.

CHAIRMAN DENARO: Write what?
MR. BELCHER: That recommendation. MEMBER MCCORMICK: Well I think it is in order. I think the priority is to first do what they have addressed here before you can even start down that path.

CHAIRMAN DENARO: I applaud your very lengthy recommendations but frankly, that is short one there sounds like to me.

MR. BELCHER: Well we fully intend to condense our recommendations.

CHAIRMAN DENARO: So yes, okay. And you know whether the future ITS PAC takes up that cause or what is their choice.

MEMBER KENNER: I have no aversion to taking it to JPO. You could even just type that in quickly, like I just did.

CHAIRMAN DENARO: Okay.

MEMBER KENNER: So then the next one I would list there, if you go back and look in the technology section from the last report, they did talk about developing open
systems in system development. And if you look at developer.com and Open XE there has been a fair amount of progress in there. There was a couple of things that are important, I think is one that it could be that every developer has to develop something. And if you have an app, you have to have the Ford one, the GM one, and so on, so that there is something related to that.

And then the other really big concern that people have, especially coming out of Europe is people that are developing intellectual property-based standards. And in spite of the language of the Car 2 Car Consortium that says that no Car 2 Car number will be charged such licensing fees. It appears that maybe that there is some lack of harmony amongst the members of that, and that is now breaking down.

So we wanted to make sure that whatever is done in this space doesn't include intellectual property or licensing
requirements because that will be a huge barrier to harmonization and a huge barrier to implementation.

So we were open-minded about where that goes. But we still think that is pretty important.

MEMBER KENNER: Yes, I am not concerned that your subcommittee gets into something that is not in the charter or you subcommittee. At this point, we are altogether. We come up with something that should be in there, we will do it.

MEMBER KENNER: Yes, but I guess it is an open question of did you guys already do that. And if so, we are good. And we don't know the answer until we go through the Technology Subcommittee.

MR. LEONARD: Steve, just another clarifying question. Are you, with this recommendation, saying that open standards, open development is more important than harmonization?
MEMBER KENNER: No, I guess we were saying we want both. Steve?

MR. SILL: Yes, I think we need to make sure when we talk about open what we are talking about. And I think Steve what you were getting at is that they not be encumbered by intellectual property, not talking about an open standard where anyone can add the material or content as they see fit but rather that the interface is open but rigorously defined. Would that be a fair way to characterize it, Steve?

MEMBER KENNER: Yes. As a matter of fact, we would apply the non-IP and licensing fees broadly.

And then the last one was one that we threw in there about the harmonization of the spectrum itself that you wouldn't have a sharing situation in some regions and then a non-sharing in others. We want the non-sharing to be something that is harmonized as well.
MEMBER McCORMICK: The question is how we would do that.

MEMBER KENNER: I don't know.

MEMBER BERG: And whether it is DOT's job.

MEMBER KENNER: Yes, I mean maybe we don't put this one in but it was something we just threw out with some of the folks that actually called into our committee.

MR. BELCHER: So it's an important issue.

CHAIRMAN DENARO: So it needs to be considered. It is not clear --

MEMBER STEENMAN: Well the first would be sharing versus non-sharing. Does it matter that in one region they share and the other one they don't, if technically it is possible to share? I think it is important that you don't have to go implement a different frequency for every region because that would be now you have to design a different system for cars that you move to
Africa or Europe or U.S.

MEMBER McCORMICK: Well, let me make it more personal for you. Let's say that Geneve creates something that it now wants to pass to Mobile and it only gets implemented in Europe. That kind of defeats the purpose of what Geneve is trying to do.

So I think there is areas outside the standardization, particularly in Open Source and in terms of whether or not the IP has been licensed domestically or through WIPO worldwide as to how it handled.

I'm not sure this doesn't fall under Justice Department, though, rather than transportation.

MEMBER KENNER: It could be Commerce.

MEMBER McCORMICK: But I think it is an area worthy of discussion. I mean this is something that I could certainly see the TRB's Transportation Law Committee Conference address and it would have the appropriate
resources and the correct familiarity with the space.

CHAIRMAN DENARO: So we need to decide what we are asking the JPO to do about that. Because that is what these recommendations are. So what are we saying? Is there a role in any recommendation that we have?

MR. BELCHER: So the role would be that as the JPO continues its efforts to global harmonization that it is cognizant or pays attention to how spectrum would be used internationally in that it tries to ensure that it is done in a consistent fashion.

CHAIRMAN DENARO: Perfect.

MR. BELCHER: Something like that would be the way to do it.

CHAIRMAN DENARO: Okay, sure.

MR. BELCHER: Because again, I think to Tom's point what you don't want is we don't want vehicles that are communicating in the United States in a non-shared
environment we built out that could be a good program in that way. And then in Europe, car parts are built on where they are actually sharing because they are not doing safety.

CHAIRMAN DENARO: And the way you said it I think is fine.

You know we have had items in the past where it is really out of the scope standards. We are not formulating standards. We talked about that. JPO and the DOT are not a standards-generating organization. So we have used words like provide leadership or whatever. And those things are good because these are still threats to the program or to deployment and we just need to make sure we understand in our recommendation what is the appropriate involvement of the JPO.

Okay.

MEMBER KENNER: And then the last one is the one that I just captured the words that we said we would incorporate into the above recommendation relative to looking at
what existing standards are there before you create a new one.

MEMBER BERG: Just as long as we put there in the right hierarchy.

MEMBER KENNER: After we talk about prioritization?

CHAIRMAN DENARO: You know what? Leave it out and see if he picks it up.

MEMBER KENNER: Putting that in there is on the top of my list. Thanks.

CHAIRMAN DENARO: Okay, are you done, Steve?

MEMBER KENNER: That's it.

CHAIRMAN DENARO: Any other comments for Steve or the team?

All right. Thank you very much, by the way. I think that was a good effort. And you know the next step would be for you guys, somebody volunteer whatever, kind of put those in some form that you are happy with. And you don't have to overly coordinate internally because we want to get
into the master as long as we are going all
day and then we will all get a chance to
kibitz back in at that point.

But just from experience, by the
way, the sooner this committee and
individuals and operators in the past, that I
have been pleasantly surprised, I guess, that
by the time we do the final version,
everybody looks it over and looks at their
own and then the rest of them are doing good.

Okay, yes, I saw that and I am good with
that.

So what that says is make sure
you like what you wrote. Because it might
just stick.

MR. BELCHER: Well I am sure you
will talk about this later, but when are you
expecting step five from us?

CHAIRMAN DENARO: Yes, well
please ask that question again if we haven't
talked about it.

COMMUNICATIONS SUBCOMMITTEE REPORT

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Okay, can we go to Paula's group before lunch?

MEMBER HAMMOND: George has the document on his computer. So how do we hook it up?

We are Communication, which is a very simple topic.

While George is doing that, one of the things we talked about and really struggled with was the number of communicators on this topic, whether it is the automakers or the technology developers or U.S. DOT and all of its administrations and the need for coordination and simplicity in communication for the target audiences, which we don't even see in this room. Half of us are wondering what jargon and different code words mean half the time.

So our recommendation really, while it is complex, it is kind of a simple recommendation. And we preambled in a way to try and describe -- tried to describe the
broad audience and people who need to be involved in communication and the need for coordination, as well as the notion that there is different kinds of communication that should happen at different times.

So right now while we are talking about NHTSA's decision and spectrum sharing and all of those things, there should be the development of -- the recommendation includes the need for development of a broad-based communication plan, both with and for all of the stakeholders -- that is where the coordination needs to come in -- but one that targets the time we are in. That we shouldn't be talking about implementing and talking to the public until there is something to talk to the public about.

So we tried to capture that with this statement. I won't read the preamble but the recommendation that says with the assistance of a communication professional -- we don't see how you do it any other way --
U.S. DOT should develop and implement an overarching, comprehensive communications plan that focuses on the most appropriate stakeholders and audiences to include internal, external, public, private, and multi levels of government. And I believe we should add and policymakers. That is another group that needs to be targeted.

The plans should be tailored to both short and long-term communication needs. We also got hung up on the notion and the issue around privacy, which we think can come up and bite any of us at any time. And unless there is proactive and early communication and outreach with privacy interests, we may find ourselves coming short just from the whole issue of privacy is so big, we are worried that that is not being attended to from a proactive sense.

MEMBER McCORMICK: On that, I mean we have the ITS World Congress coming up in Detroit in 2014. And that has America as
a C3 is the perfect entity to communicate to the public as part of an awareness program in front of that. And then whatever and all the things you are doing to demonstrate it. But people that attend that are generally within the industry.

The biggest issue we have is that the consumer, the non-technical, non-automotive, non-telecommunication, 99 percent of the people who aren't aware of this and the benefits and why we are going down this path. And it is being taken over by the mainstream press who, like I said, most of the time they get it wrong. You know they talk to somebody that started a car sharing app years ago and all of a sudden they are an expert on V2V.

And I think it might carry more weight rather than as a recommendation just so we could do this, possibly give examples or possibly identify venues or reasons for why we should do this. Because there is a
perfect opportunity coming up. And quite frankly, the perfect organization to do that, you know to the public, you are the guys that did the 50th anniversary of the Eisenhower Expressway, right?

And so I recognize you can't advocate for yourself but I will here. That is the vehicle by which we have to communicate with the public. And I just think we ought to use that resource.

MEMBER HAMMOND: I don't know. My take is, I think every venue is the right venue to continue the conversation. But I don't think the public cares about this until Ford Motor Company or someone else says hey look at the gizmo I can put on your car that is going to help maybe save your life.

And to me, maybe the public or some level of public should get involved in these decisions about spectrum sharing and protection of the ability for us to develop this. But I think they are a pretty small
group.

MEMBER McCormick: I disagree with that. A number of years after the bridge fell down in Minneapolis, Kirk Steudle came to me and he said in three weeks from now, I need to outfit the Mackinac Bridge with wireless sensors and communicate that to a vehicle that drives over it that help monitor sensors. And we got all the industries involved and pull that apart.

We were supposed to get bragging rights in the press for the members companies that all contributed resources to do that. And at the last minute, the Governor's press agent says oh no, no, no, we don't want to advertise this because we don't want anybody to think there is anything wrong with the bridge.

Now, I have been over the bridge when I was one-year-old, the year it was built. And my 85-year-old or 86-year-old mother, when I explained this to her, she
said what idiot made that decision? She said every bridge in the country was built before computers. She said it is obvious that we should be monitoring the health of them, knowing that we don't have dollars for infrastructure.

So I think there is a lot of general push back that says I don't think they care. The reality is, I think they care a lot. I just don't think they have been communicated with effectively.

MEMBER CALABRESE: I think that is what we are saying, then communicate them effectively. But the message had to be simple and well thought out and tailor it to the audience.

MEMBER MCCORMICK: Right.

MEMBER HAMMOND: And what do you want to tell them right now? What would you tell them that would rock their world? You want to say hey, there is something coming but there is a lot of government decisions
that need to be made that can make it happen.
And here is what you, as a citizen should do.

MEMBER McCORMICK: There are five of us that are members of the Congressional ITS Advisory Caucus on the industry side. And every year we present to the 56 or 57 senators and congress a four or five page document that said here is the technology and the directions they are going that are going to solve a large number of problems.

The problem is is that improving transportation is not a contentious subject. If you are one party versus another, whatever you do advantages both members' constituents at low, medium, and national levels of government.

So unfortunately, we never end up with an advocate. And when I look at how do we get advocacy on the Hill, which provides funding, which provides direction, it is largely driven by who think they are going to
get voted into office over it.

So if we can create a desire for it, it gets on to the agenda of the politicians. These guys, they can't do that advocacy. They are doing their job. But if we make them aware that hey, let's supplement the message out there and have the marketers of the world figure out what that message should be, rather than Wired and Popular Mechanics and a bunch of others that always get it wrong.

Let's get a message out there that says here is why we are looking at it. Here is where we are going. Don't discount what anybody else is doing or saying or correct or anything else. Just say here is what is going on and use the media that we have, the mechanisms that we have available to do that.

Because until you get the public to want it, they are not going to ask for it when they go in to buy your car. They are
not going to look at it on their phone system and they are certainly not going to vote into office somebody that is going to fix their drive.

MEMBER HAMMOND: And I think we are saying that. So I think that is good.

MEMBER McCORMICK: I think you are. I just think it is at a higher level. I think it is just a question of priority.

MEMBER HAMMOND: Yes, you and I might disagree on who cares when.

MEMBER KISSINGER: I don't think we felt that our first priority was trying to educate the general public.

MEMBER McCORMICK: I'll give you that.

MEMBER HAMMOND: And I wanted to point out we got these on our tables when we came. And these are some materials that are being produced by the JPO now which are really well done. Where if the citizens look at it and say imagine if you are able to
build your own connected vehicle, all of these things that are very plainly spoken I think are very good.

So there is a start to this communication strategy.

CHAIRMAN DENARO: Also, if you go in and read the update to the constituted plan, the midterm update to it, there is a summary in there of what we have done kind of thing. And there is a list of all the publicity that the JPO managed to garner and literally this pub, that pub, this radio show, whatever. And that is kind of interesting.

So that kind of drummed the publicity I think is valuable as well.

MEMBER HAMMOND: So I think all of what we said fits into this recommendation.

MEMBER CALABRESE: And part of hitting the stakeholders is to encourage them now to reach out to their audiences. Okay, I
mean that just really got to be the message, the message tailored to the audiences, to the association, the venue to reach out to their people.

MR. CRONIN: I would add to that. That would be my one question. So we have actually gone and hired a communications person. That is why that brochure looks better. That is one of the reasons. There is more articles coming out.

MAP-21 has removed the restriction on how much we can spend on outreach. So that helps us. But I think we are still very much limited by we are a small office. And so we can reach to the breadth of DOT but there is thousands of transit agencies. There is 50 states but lots and lots of cities. We are going to need help. And whether that is the associations or whatever.

So my question would be are there examples of other things of this magnitude in
which communication was done well that we can start looking into to try to figure out how do we get all these different associations onto the message with us and then out?

I mean one of our biggest problems is we get invited to speak about this every week. We don't have enough people to do that. So we need to start reaching out through whether it is this group and the associations. So if there is any advice on how to do that more effectively, it would be appreciated.

MEMBER KISSINGER: Whether you believe the issue or not, look at the distracted driving. It became a household name. We put it on everyone's radar.

MEMBER CALABRESE: We are actually working through the associations but you have got to come up with that tailored message, identify the right associations, and work through them, then use their communication networks.
CHAIRMAN DENARO: You know any company that has a marketing budget for a new product or whatever has to make decisions on how most effectively to promote that. And kind of a similar situation as you just said, there is a thousand conferences you can go and present at. Some of them you end up in a session and there are four people there.

So you go through an analysis and say what is my ROI of each piece and then you start prioritizing. And I think that is what we are talking about here. Maybe the answer there is I don't know what this communications specialist does but maybe it is more than PowerPoint and graphic arts. Maybe it is also marketing and outreach strategy.

MEMBER HAMMOND: Well that would be a good communication plan, including the tools.

MEMBER McCORMICK: I don't know this isn't a recommendation but one of the
things that you have the ability to do as the JPO or the DOT is to say I want to create a cooperative agreement. I will create one with CVTA. I will create one with Consumer Electronics Association. I will create one with the Aftermarket Industry Association and say here is what the cooperative agreement is. I am going to send you the announcement that helps to be educated. And in return for you getting them, you are going to send them out to your membership. My contact database is 15,000 people worldwide. His has got to be two or three times that, as well as the cooperative units around the world. It doesn't have to be -- and it is just one of those things that says that there is no cost to it, other than saying we are going to use that -- we are going to ask if we can use a channel to do that. Okay?

The advantage is that for his members, for my members, for whatever, we get the information the day you release it.
Right? That is valuable because people don't have the time to go search through the news or to Google everything else to find out what is going on. Harvesting what is going on in the industry or at the government level is no one's job practically unless you are Cisco or Intel or whatever. They just don't have the resources to do that.

And that is one of the advantages of having all these associations. It says this now can become a conduit. The only rule is, don't change anything I said.

You know, that is a simple request and it provides every one of the organizations, I don't care if it is SAE, will go okay, I can see how this has value to some constituency in my membership. Right? Plus it is that I am part of the feeling that you are now the mother of all inclusiveness.

Just a thought. It is not part of your recommendation. I don't mean to get off topic. But it is just a thought that
there are ways to do that through outreach
without having to go through a formal request
for a proposal.

CHAIRMAN DENARO: You know there
is kind of a principle of marketing that says
in the early stage of a new technology
product or whatever, advertising makes little
sense. You need publicity.

So the kind of stuff you are
doing with your pilots and things like that.

But really getting the press involved in
that, it is free. They show up. They decide
to write something. Maybe they don't, which
means it fails. So you get free publicity in
the early stages.

After that is out there, and then
that gets the public aware and so forth. The
way to maintain that exposure, then, is
through advertising and direct mail and
materials and so forth.

So I don't know where I'm going
with this but something here which says you
have got to be creative about sneaky ways to create publicity in the early days.

MEMBER McCormick: Yes, putting it the Federal Registry would help. I mean other than the industries and the Beltway Patriots, I think it --

CHAIRMAN Denaro: Well and I have got mixed emotions holding up that document. I agree as well but my problem is where do those things end up being viewed? And that is always a problem.

And again, I will go back to my experience in a private company to create what little cells and they sit on your booth in some trade show. I don't think people really --

MEMBER McCormick: That is the difference between publicity and marketing. There is no such thing as bad publicity. There is bad marketing.

MEMBER Hammond: I just like the plain talk here. I thought the plain talk
was really good. There is no jargon. It was just imagine if --

CHAIRMAN DENARO: I would completely agree with you. I think it is well done. My question is --

MEMBER HAMMOND: Who is going to see it.

CHAIRMAN DENARO: -- what does it result in? I mean who ends up reading that stuff? How do you get it out?

MEMBER BERG: Putting out the right message at the right time to the right people is really the key, I think.

CHAIRMAN DENARO: Yes.

MEMBER McCORMICK: Well the other thing you can do is you can ask the operators. I mean, they don't sell to the consumers. They sell to dealers but they market to consumers. They have a lot of brilliant people that know how to communicate the message to the average person.

MEMBER STEENMAN: But we also
need to make sure that as we communicate
something that we know what we are asking the
consumer to do. Because you can't go buy a
car today but you need a clear -- what is the
action we want someone to take? Maybe for
now it is go to your whatever Congressman and
like push for this type of technology. Otherwise, they can just leave, you have
educated them, and they say okay, this is
great and they go to dinner.

MEMBER McCormick: I would just
give them John and Steve's email and ask them
when you can buy one.

MEMBER Steenman: Right.

MEMBER CAPP: If that is all
their questions, maybe consumers don't need
to do anything. You need to think about all
the spectrum of possibilities. You know, is
it something they need to know about too
soon? Some technologies you know about it
too soon.

You worry about stuff that isn't
even there.

    MR. BELCHER:  Well isn't it the recommendation that the Department of Transportation should -- I mean I thought the recommendation should engage communication professionals in helping do this, rather than have 20 engineers who are not trained in communications to try and solve the problem.

    MEMBER HAMMOND:  So that is our offering.

    CHAIRMAN DENARO:  I like it. All right, I think there is a lot of ideas around the table. Let's let this one simmer a while, too. I maybe once you got all of it, I would suggest then after everyone sleeps on this and you see the final version come around for review, if there are additional recommendations, go ahead, put them in there and let's all take a look.

    I think it is a really important area. I think Ton asked a really important question of what do you want to achieve.
What you said John about the timing I think is an important issue. So I think we need to think about this for a while.

MEMBER CALABRESE: The message changes. And the message changes based on where we are. And the message changes based on the audience. So that is part of the plan. We need a comprehensive plan --

MEMBER HOLTZMAN: We need the plan. That is our point.

MEMBER CALABRESE: -- and it is not coming from this group.

MEMBER HOLTZMAN: And we want to make sure the message is very clear. And that is why we need professionals.

MEMBER WEBB: I just want to add to Scott's comment earlier. All the associations that I am in, I am desperately looking for articles all the time, asking people to contribute to their newsletters or whatever.

So the instantaneous delivery of
that kind of stuff is, again, even just some small, a few paragraphs, saying here is what is happening in the connect your vehicle world or whatever. You know people will either choose to read when they scan the article through the first sentence or whatever. But it is an easy distribution. Most of my stuff is now done. I get my things on email. So I mean it is not a hard copy and it is always there.

CHAIRMAN DENARO: This thing is fraught with landmines, obviously. Because on one hand I am saying publicity is really cool and you can use the expression wow maybe it will go viral or whatever but there is also things in here like privacy. And if that is what the media grabs onto, we take two steps back.

So on one hand you want to get it out there in the public. But on the other hand you want to attempt to control the message. And that is not easy.
MEMBER WEBB: Well we heard that the pilot is going to end this month. Right?

Is there going to be any publicity a month later or two months later about the results or what came out or these wonderful things, look at all these incidences that occurred and didn't happen because? I mean is that a part of the process and follow-up? I see a nod of the head over there.

MR. CRONIN: Yes, I am struggling because we did it to get data and sort of make a decision. NHTSA won't release information until they have made their decision. So the answer is yes but they are not going to say a whole lot.

So we say things. We talk about we are getting the number of interactions we need. It is more than meeting our need. We are getting the data we expect. It has been successful. We have learned a lot. But it is going to have this much benefit. They are not going to say it until it is part of their
decision. So Ken might, I don't know if you want to add anything else.

CHAIRMAN DENARO: We might consider a recommendation regarding that. That is fine if that is the timing. But JPO formulate an effective positive communications story once the information is available and ready to be released to maximize the value of all that work that was done, not just for the NHTSA decision but also for its publicity value.

Certainly Ann Arbor people know about it, you know the University of Michigan.

MEMBER McCORMICK: According to their press, it is their project.

CHAIRMAN DENARO: I know.

VICE CHAIRMAN KLEIN: But can they publicize it? I guess the agreement is that NHTSA has the decision over publicity over it.

MR. CRONIN: We have some of both
in there. We have asked them to do publicity
about the safety pilot. But yet the results
NHTSA will talk. But what we are doing, what
we are trying to achieve, some of the
progress of it they are talking about.

I think the big thing is it will
be tied into this NHTSA decision. And this
NHTSA decision is going to involve the
Secretary and it is going to involve the
White House. So we have an opportunity of
like a distracted driving message and we need
to take advantage of it.

MEMBER McCORMICK: I wouldn't put
it in that light. I mean just because that
came out more of a knee jerk response, rather
than we are moving forward to your new
vision. I love your new vision. It is an
agile transportation system. The whole --
Ray LaHood would have called me and said we
need you to put together a statement on
distracted driving before we ever do anything
with it.
So we were aware of what was going on but when it came out, it was more dropped like a bombshell than here is how we are going to advance the world. This is more about meeting that vision than advancing the world. It needs to be more positive.

There is two ways to do public affairs. One is disaster control and one is hype. And we really need the hype going out this time.

MR. CRONIN: Yes, my point was just more as the Secretary will be engaged in this and it will be a major thing for the Department. I mean so it is not going to be me announcing it. I this going to be at the top.

VICE CHAIRMAN KLEIN: So then one point is that there is a major communications opportunity in the foreseeable future, maybe ramping up to that and hitting it well out of the ballpark.

MEMBER KISSINGER: Every
Secretary needs a higher bar. We got a new one.

CHAIRMAN DENARO: Good luck. All right. Anything else Paula?

MEMBER HAMMOND: No, thank you.

CHAIRMAN DENARO: Okay.

MEMBER HAMMOND: We will finally take edits.

CHAIRMAN DENARO: Great. Let's see, we still have got 20 minutes before lunch. Are you up next, Hans?

VICE CHAIRMAN KLEIN: I could do it, although we don't have power.

(Pause.)

MARKET-DRIVEN ADOPTION STRATEGY SUBCOMMITTEE

VICE CHAIRMAN KLEIN: Okay, the Implementation Subcommittee draft recommendations, in no particular order. Some of these issues obviously you are familiar with from our discussions.

And the core members of this group are Steve Albert, and Ron -- what is
Ron's last name? Ron Kirby, okay, and myself. So it has got appropriately strong local representation, local agency representation on the committee. That is a positive aspect of it.

Our first recommendation, nomenclature we discussed this issue over yesterday and today, terms like adoption, implementation and deployment refer to important activities but their meanings for the ITS program are not always clear. We recommend that DOT should clarify nomenclature. Terms such as innovation, adoption, deployment, and others should be rigorously defined and terms should be used, then consistently in both internal planning documents and external communications.

We had a discussion of this, I remember, at the very first meeting of the ITS PAC. Some documents talk about deployment. Some documents talk about implementation. What is the difference?
What does it mean? And even within the program it wasn't always clear.

Number two, more broadly U.S. DOT should clarify all nomenclature in the program. Terms like V2V, automated vehicles, autonomous vehicles, driverless cars, et cetera, should be defined and used consistently.

My guess is this is getting this absolutely once and for all it will never happen but it would be a very useful thing for at least maybe the JPO to say this is how we use these terms. We may not be speaking for everybody but here it is. And then just the last one, a reference document for nomenclature should be produced. This could possibly be part of the strategic plan.

MEMBER McCormick: Yes, that was going to be my one suggestion. Should we define for the context within which they use it? Because this is definitely a connected vehicle versus his, versus however they want
to apply that universal term now.

MEMBER CAPP: We could have a
definition for the world.

MEMBER McCORMICK: Yes, in the
context of how they want to use it and then
use it consistently. Because they will never
define it. And once they put out a
definition and say this is a definition of
connected vehicle, it will just create a
firestorm.

But if you are saying define
within the context for which they are using
it.

VICE CHAIRMAN KLEIN: And that
might be part of the fine points of actually
doing the definitions.

MEMBER McCORMICK: Right I like
that.

VICE CHAIRMAN KLEIN: I mean we
as a committee would benefit from that
decision.
comment though that this potentially ties back to the discussion we just had about communications. And I will give you a practical example there.

I am involved in TRB on automated vehicles. Everyone initially was calling them autonomous vehicles. One particular individual in this group vehemently objected to the use of autonomous because supposedly that means it is not communicating with anything else and most of these automated vehicles will. So they wanted to use automated vehicles as being the most accurate and precise way to describe it, which no one disagreed with that.

The problem is the media and everyone else seems to be jumping on driverless cars. So I am picking the ones that you have got up there.

And I have been arguing, folks we corner ourselves and paint ourselves in to this little corner and insist on saying
automated vehicles when the whole world is calling it driverless cars, we are not going to get done what we want to get done here.

So at some point --

MEMBER CAPP: That part is changing so fast that you can't spend too much energy worrying about it.

CHAIRMAN DENARO: Exactly. And at some point you have got to go with it.

MEMBER CAPP: Driverless didn't exist two years ago.

CHAIRMAN DENARO: So back to communications, --

MEMBER CAPP: A couple, fifty years, when people like it, it is going to go away again, too.

CHAIRMAN DENARO: Yes. But my point is, back to communications, if we attempt to only say automated vehicles when the whole world is calling it driverless cars, people are not going to get it. So I am just giving that caveat in there.
MEMBER McCORMICK: Well there is nothing that says we can't define both those terms in the context. The driverless car is the one that doesn't require a driver.

CHAIRMAN DENARO: You know, I said that yesterday. I am kind of saying a little flexibility here is probably worthwhile. And you know what? The ultimate name for some of these things probably hasn't been invented yet.

Somebody is going to coin something someday that everyone likes. It is going to have some alliteration with it or something and that will be it.

MR. BELCHER: But Hans, your point isn't that we are going to define these terms for the world. You are saying you want it within DOT, you want to make sure that they are using consistent terms at least within DOT and its stakeholders are commonly understood references. Is that correct?

VICE CHAIRMAN KLEIN: Yes. I
mean the phrase I use I just highlight it. Both internal planning documents and external communications. Internal planning documents --

MR. BELCHER: From the DOT.

VICE CHAIRMAN KLEIN: Yes. So certainly internal planning documents among the people who are really committed and working on it, I think we can get a high degree of precision or aim for a high degree of precision in the nomenclature in the language that we are using. Once it goes public and the media picks it up, whatever.

But certainly the strategic plan, I haven't read it closely with this in mind.

One question, does the strategic plan -- is it very careful about language and does it use words very consistently and very precisely?

When it uses implementation here and adoption there, is that because it is referring to two quite different things when
we really understand the difference between them or is it because sometimes one person wrote the second other person wrote that section and they used different words.

So the clarity is really important to the extent you can achieve it. There is also always going to be ambiguity in collective documents and I don't deny that. So it is hard work to get nomenclature as good as it can be.

MEMBER McCORMICK: Well I think that is why the last bullet is excellent because that is what came up yesterday that there is no glossary. There is a list of acronyms but there is no glossary at this point. Although some terms are defined throughout the document, the idea of saying we need a glossary or some nomenclature reference beyond acronyms would be a very valuable thing.

VICE CHAIRMAN KLEIN: Okay so a reference document. I will even say
glossary.

Okay, so that one.

MEMBER McCORMICK: I would say should be part of the strategic plan instead of could.

VICE CHAIRMAN KLEIN: Okay.

Number two, standard user interface in vehicle systems show great promise, especially for driver safety. However, growth in vehicle functionality requires more complex user interfaces because different OEMs offer more and more in-vehicle functions. Drivers may be confused by proprietary interfaces. This could negatively impact adoption.

U.S. DOT should support a standard user interface. In a standard user interface, essential functions would be presented to drivers in the same way across all vehicles. We believe that this can be done in a manner that does not dilute product differentiation.
So again by the time when the technology is coming out at the user level, make sure that we don't want to have people turned off by it when it comes down to adoption and deployment because they are confused by you can't find the brake. That is a bad example.

MEMBER CAPP: I would say that is the least of all the risks that exist right now in the space is that the user is going to be turned off by interface differences and the technology is going to go bye-bye.

Of all the hurdles we have to come over, I don't think that is a significant one.

And also there is a presumption of guilt in the description here that it is meant to confuse and play games to do standard. I mean I would support a standard that say this is an open question. I think we want the DOT to study it. As we heard in Buce's area, they are already studying safety
aspects of how we do active safety messaging. Should there or does there not need to be consistency and certain features and this and that.

So I mean the DOT is studying this. It is just really without regard to wireless or how we get it, rather than the vehicle doesn't -- the customer doesn't care. The driver doesn't care how the car determines if there is a risk. They only care what they are being told.

So this question is somewhat independent of ITS type systems or other active safety systems or whatever. So I mean I would suggest that NHTSA has already studied this. If we want to ask JPO to do some of their own work we could, as an opening question. But I would not presume that it is going to negatively impact and things like that.

VICE CHAIRMAN KLEIN: Okay.

Definitely there was no automaker
representation on our subgroup. So wordsmithing assistance definitely I think it will benefit from that. And the question of whether it is already being done like half our recommendations. You are always kind of wondering is this already being done. And I think -- I know that some work --

MEMBER CAPP: Well NHTSA's research roadmap, there aren't that many items on it. This is one of them. They are actively in the whole context of driver assistance automation, they are actively studying what they call a DVI, Driver Vehicle Interface. A company called HMI is driving performance. There was a whole bunch of terms.

Yes, so they are engaged in trying to understand is there a need for consistent messaging on some of these active safety systems. It is a fair open question.

But it really has nothing to do with which technology approach we take to do
these features.

VICE CHAIRMAN KLEIN: User interface is a separate issue --

MEMBER CAPP: Yes.

VICE CHAIRMAN KLEIN: -- which is what --

MEMBER CAPP: Yes, so they are depicting a recommendation to make sure that resulting features from this technology, make sure that we understand that the user interfaces are understood or should be accepted --

MR. BELCHER: I think that is the important piece here. If we don't come across too strong on the interface. Consistent because that is where you guys compete is how you communicate with --

MEMBER CAPP: I know from our experiencing in developing some of the features we have deployed already, it is not that easy to determine what is the right way to do some of these things.
So be careful what you ask for. When you ask somebody will you create some standards for me and we get them. Now, you have to live with them on some new technology. We don't really know what is the best way to do it.

CHAIRMAN DENARO: Right, there is fine line there because you standardize this kind of interface, it has two potential downsides. One is it removes differentiation between car companies who would like to differentiate, as long as it doesn't create confusion.

The second thing, it does limit innovation. You know if --

MEMBER CAPP: That is what I was referring to. I am more worried about that than differentiation.

CHAIRMAN DENARO: Exactly. If we decide ahead of time we think we know what is right and you can't do anything different, there might be another company that comes up
with a brilliant idea but there is no way to
do it that peddle pushes back instead of
whatever, those kind of things.

And by the way, that could happen
because of a new technology. There might be
a way to do something with some hologram or
whatever and it is way too expensive. No one
is going to touch that. But five years'
hence, technology makes a change there. All
of a sudden something is possible. You want
to have the ability to do that. So this is a
tough area.

MEMBER McCORMICK: Well the other
thing is not -- user interface is not like
the PC or a phone. It is very much
environmentally constrained in the vehicle,
whether that is an aircraft, a locomotive or
a car. The difference is in the type of
lighting you use, the coloring of the
interior, the distance that you are reaching
to access controls. So to come back and say
well you ought to standardize the interface,
the reality is that they have created an environment that all of their scientists and specialists and tiers have figured out how this works for the most efficacy and for the safest manner for the vehicle.

So now to say well oh, okay, Toyota, you have got to be the same as BMW, besides all the other reason for brand sensitivity and for everything else, it is a fully-engineered solution right now. Like all things, all human endeavors, there is always room for improvement but to come back and say standard, we have to know what works the best to your point, Bob.

MEMBER CAPP: And the other thing, too, is that realistically the features that are being talked about when we talked about collision warnings is a generic one, blind zone, things like that, these are features that already exist. How we do those can get better. Some of those maybe should have some consistency in driver interface and
some of them may be not necessary. Those are exactly the types of features that this is studying.

I think it is somewhat of an independent issue from this whole ITS space, which is certainly not an impediment to the technology at all. It is not an impediment at all towards us getting to deployment.

MR. CRONIN: I mean I would just add so yes, NHTSA is studying it and yes, JPO is funding NHTSA to study it. So they are doing stuff on their own but we are putting some natural resources into human factors, driver --

VICE CHAIRMAN KLEIN: Well we could turn this -- it becomes an affirmation. We strongly support what is going on. We recognize the importance of this and affirm it.

Plus and anything that sounds even slightly negative, OEM is going to want to take that. That is a wordsmithing issue
so I don't want to do that. But I think the importance of this issue is huge but I think there is work going on in this area.

MEMBER CAPP: Yes, maybe it is just a statement about if we agree we want the JPO or the DOT to study human interfaces with these systems and maybe describe in a little more detail but not necessarily called it --

CHAIRMAN DENARO: Why don't we take this offline and let's reword it.

VICE CHAIRMAN KLEIN: Yes, John maybe over lunch or something we could at least get the next iteration.

Okay so here we coined a phrase that we found useful and encourage its use, which is the idea of a DSCRC-necessary app or application should be developed.

The DSRC program is very promising and should benefit from near-term demonstrations of its utility.
So we recommend that U.S. DOT should develop DSRC-necessary apps. These are apps whose functioning demands the characteristics of the DSRC network, i.e., demands high-speed security privacy. These apps would demonstrate the benefits of such a network and would demonstrate the necessity of the 5.9 gigahertz frequency allocation or some similar allocation.

Such apps could be opportunistic, might target commercial vehicles that might be implemented on the aftermarket. Again, this is built in on yesterday's discussion. Just more apps that demonstrate the value of the underlying network.

Recommendation two, U.S. DOT should seek federal funding for additional DSRC pilot deployments at the state and local level. These pilots would education local officials and local publics about the benefits of DSRC-based systems.

The second point is a little bit
on the communications side, what happened in Ann Arbor.

Basically building DSRC you want to, on the one hand, show that it has got those things running on it that we can demonstrate already today. And secondarily, even if the larger systems are not yet ready for full deployment, having pilot demonstrations it was called have a very important public education function. So things like Ann Arbor happening in other places.

There was a discussion about the federal funding for these. So it is seeking federal funding for more of this kind of pilot project.

MR. BELCHER: How is it different from what they are doing? I mean so they have got a series of apps already. They are going to develop a series of vehicle infrastructure apps so that that is in their work plan. And then they are -- I mean and
Brian talked about the move to pilots.

So we are just affirming that and saying atta boy or are we asking them to do something different or more?

MEMBER McCORMICK: Say I am reading this and I am reading this as not a pilot deployment but I am reading this as demonstration.

VICE CHAIRMAN KLEIN: Number one is the deployment. Number two is the demonstration.

MR. CRONIN: Okay. Let me tell you what I hear the difference is in number one. So when we created this strategic plan from 2010 to 2014, we were asked to look at all communications. So there are applications that we are doing that used DRSC but there is a whole bunch that don't.

So what is different to me is you are telling us to focus on DSRC, which is fine. I mean other people are telling us that, too. But that is what I read that as
different. You are telling us we need to get DSRC-based applications out there. WE need to be thinking about that, which is different than when we started the mobility the AERIS.

So V2I safety, yes. There is some of the applications we are doing do use DSCRC but there is a lot that don't need it.

MEMBER McCORMICK: And that would be my question. Is this really about DSRC or if we replace DSRC and made it V2X, we are back to where the world was. We go back to the cube. What is commercial services? What is mobility? What is safety versus what communication protocol it works for.

If we are encouraging -- and I don't know that I want the U.S. DOT to develop the apps but I would rather have the --

VICE CHAIRMAN KLEIN: Yes, that can be wordsmithed.

MEMBER McCORMICK: But I see that these fit together nicely that says okay,
let's encourage the government V2X thing so that we can demonstrate the reason for going down this path. And then secondly fund for some demonstrations so people can understand it. It is a little bit different flavor than -- because most people when you start talking about DSRC, they start to glaze over.

VICE CHAIRMAN KLEIN: Well part -- so the two are quite distinct. So the first one is you could almost phrase it, okay we have got this DSRC. Why do you need DSRC? Because there is a whole bunch of apps that are DSRC-necessary apps. You are not going to get these apps if you don't have DSRC. All right, email is not a DSRC-necessary app. You can do it anywhere you want. But some other things are DSRC-necessary.

We have got the original suite which is a collision warning. But the problem with collision warning is that the big payoff is way out there.

So where is a near-term payoff, a
high value near-term app that only runs in DSRC and that is why we need DSRC right now. That justifies it in today's situation.

MEMBER STEENMAN: But the challenge is that there is no DSRC network deployment without the V2V. Because if there is no V2V, then where is this DSRC network that we are going to run these apps on? And why are we making the public aware of this?

MR. CRONIN: One way to encourage DSRC apps is to put DSRC-based infrastructure out there. I mean so that is the way I read that.

And number two, I think the question is we are a hundred million dollar a year research program with research still to do. So what I read number two as you are saying maybe you do need some more federal funding if we want to do multiple pilots. I mean if we want one or two, yes, we can fit that in the budget. If we need five, six, seven, eight, that is going to be hard for us...
to do.

MEMBER CAPP: And what is needed to permit deployment? I mean Ann Arbor was not done as a way to get public opinion. It was a scientific experiment to collect necessary data. We needed another one because the data is insufficient. Okay, we will learn about that in a moment.

MEMBER McCORMICK: And we have employed infrastructure. You have developed a testing pilot under SAIC that is in process or have just completed modernizing it. So I don't know that you need to have every little community have their own demo. I think what you need to have is if you want to create a demo to help people understand it V2X, which includes multiple communication protocols and how many people care what cellular network you are going over for all intents and purposes. But if you look at and say we are going to create demonstrations so that you understand the value of this program, you can
do it there at the deployed facilities in California and then market it and then publish it. You don't have to do deployments everywhere. That is a very expensive thing to do. But you can do one and we have like cameras to take pictures of it and things like that where we can put it on YouTube for all that matters.

MEMBER STEENMAN: We have a chicken and the egg problem here. Because it is like doing another one or two pilots is not going to increase the viability of DSRC in the industry. Nobody is going to care because there is still no mass deployment. Until you get the mass deployment, nobody is going to care. And even the apps are going to be irrelevant.

Okay now we have developed a great DSRC app but you can't use it anywhere, so nobody is going to care.

MEMBER McCORMICK: Well, we didn't care if they had a GSMA or a CBMA.
VICE CHAIRMAN KLEIN: Well we talked about some of these early application areas which we are listing --

MEMBER STEENMAN: And nobody is going to be able to use it.

VICE CHAIRMAN KLEIN: -- you know the commercial vehicles' "opportunistic deployments." And it is probably, it might be aftermarket, starting some aftermarket prices.

MEMBER ALBERT: Part of this was leveraging, right?

VICE CHAIRMAN KLEIN: What's that?

MEMBER ALBERT: It was leveraging. I'm saying what was there and what could be done on top of that to really add value and to show implementation.

VICE CHAIRMAN KLEIN: See the problem, what you are saying is that is the problem. Until the network is in place, DSRC is a kind of a pure research program that has
no relevance to our lives. It is like you don't want to be in that situation.

Actually it would be nice if DSRC did have some relevance right off. Is there a way to break the chicken and egg cycle and it might be that you have to come up with some apps that get utility off your back even with a full equipping --

MEMBER STEENMAN: But you would have to come up -- the DOT would have to come up with a -- or the industry would need to come up with a consumer-adaptable, at a relatively quick pace, type of system application so that now consumers suddenly in decent volume buy aftermarket devices and put these apps on it.

MEMBER CAPP: Yes, this is exactly why we concluded over the course of X number of years that this technology isn't going to become viable for those reasons because there is other ways to do those apps. But if we really want to get the safety
stuff done, this seems to be the only viable technology. Isn't that interesting?

Let's try all these other ways to prime the pump. None of them are going to work. Europe is trying a different way to prime the pump. Everybody here is saying we are going to have come to the DOT and have NHTSA start this rulemaking process. That is the only likely way it is going to happen. So it is not about all of the other apps. And then this is going to prime the pump with their decision here.

And as I see it, we have all said that that is what is going to happen. So then you are going to start to see it on cars and then it will start the safety thing.

The aftermarket thing is still a big open question. We need to make sure that maybe that is where this we are going to get to. The aftermarket piece is needed to get the volume up, to get the benefits that we want. That is where there is still no apps.
There is no business case. I don't see anybody -- I mean we haven't figured out how do we prime that pump.

MR. BELCHER: But John and Roger, aren't you -- you have gotten a new contract. CAP has gotten a new contract. And one of the major tasks of the new contract is to develop V2I Game 1 Apps. So there are applications that users who either get technology deployed in their cars or through aftermarket can see real value, even if they are not getting the value up from V2I. I mean that is the game plan, right?

MEMBER CAPP: But I still think it was an open question as to whether there will be demand for whatever that price in that box is. And I am not sure it will be cheap with parts. Pick $100 or $200. People who heard me talk, I throw out those numbers, they say it doesn't really matter. Who is going to want to buy it for that app?

Somehow it is going to need to be
incentive. Somebody is going to need to say you have to buy this aftermarket device to get your driver's license renewed or maybe I will give you an insurance discount. I don't know. Somebody has got to take money out of their pocket to make somebody want to have the aftermarket device because I don't think the apps are going to be that compelling.

CHAIRMAN DENARO: Well the other question I had, it gets back to DSRC-necessary app. So this contract is the expectation that these Day One apps can only be done on DSRC or are we just going to conveniently do them on DSRC even though we could have done them on cellular? Because I am not sure that is not a null set.

Is there any app that needs DSRC besides what we already know about, which is safety?

MEMBER McCORMICK: No.

MEMBER STEENMAN: And the only way to make it happen is that is the safety
is to say you have got to have it. This is why the whole way that doesn't happen.

MEMBER BERG: It is not a consumer driven app.

MEMBER STEENMAN: Right and you make them only for DSRC and they also work on cellular, the first thing that will happen is developer will put them on cell phones and then the whole community will migrate to cell phones. We will use them on the cell phones. Just because of the volume of devices out there.

MEMBER SCHROMSKY: I have a question. If you have -- before you go to that. I think one of the things, Bob I think we had a discussion in the second meeting or something. What evolved from all the applications and everything else, I think you just hit the nail on the head, DSRC, V2V is safety and the only way to enable this and to trust to verify it to pass those five or six mutual shared upon between Ford and GM. I
need some kind of communication like this.

    Because today -- I will use Progressive. All right? People don't know. There is a cellular component in there. I mean there is connectivity building. What people are buying is a cheaper insurance rate. That is what they are buying in the technology. The same thing if I go to Delphi or something like that to get diagnostics aftermarket for my engine and if my car is stolen. The sell of the app is protection of my vehicle. I don't, the user doesn't really, for lack of a better word, care what is in there to make that happen. They are buying a service or solution and the technology enables it. They don't care. They only know is I plug it in and that is all I want to do.

    But I think what we lose sometimes is we all agree a lot of different apps don't really need the functionality of the vehicle. I can do a lot of this. That
is the battle between if I buy an onboard navigation or I just use my phone to do that. Do I pay that $500 premium to make that or can I get my phone and that will be my maximum --

So I think what I always kind of struggle with this sometimes is I believe DSRC to enable V2V communication with the mind of safety, is inherent. I think that is what we have to focus upon. I think sometimes we get lost on well I can do this, this, this. The marketplace will dictate that. But if it is just safety, that is where DOT steps in and says in what -- to enable safety, this has to be standard. We all agree. This is how we are going to enable it and move on.

I think we get lost sometimes in these meetings that well it can do this. I'm sure it can but safety should be priority number one. I think we just get lost.

MEMBER McCormick: The reason is
something different. If I take this to a higher level of abstraction and I go well what is it that we are trying to achieve by doing this or anything, what is it that you want the recipient to get? And it says and would demonstrate the necessity. Let's just say it is V2X for right now and the second one says would educate officials in public about the system. We know that we need to do that. We have already talked about the need for the communication plan and how to address that and who could push it out, et cetera, et cetera, et cetera.

When you get down into the DSRC necessary apps, all the things that he just said, all the things that they just said, there is no reason to make that kind of recommendation. So my question is, is that are we back to really looking to create apps or are we really looking to figure out how to demonstrate and educate what is coming down to create this agile transportation system?
VICE CHAIRMAN KLEIN: Part of it is on the committee there is a discussion. There is a part of it is why do you need DSRC? If the set of DSRC-necessary apps is very small, then the program looks vulnerable possibly within the current FCC hearing. The benefits are so far out.

So the question is are there any near-term benefits that you can get on this? And yes, you can run anything you want for DSRC but what needs it? What is a DSRC-necessary app in the near-term? The very interesting answer, and it is for me a significant takeaway from this whole two-day meeting, no, no, no, no, no. I heard five nos on the what is the set of DSRC-necessary apps. It is safety. And that is it. That is the only app that that absolutely needs this underlying network capability. It is only safety.

VICE CHAIRMAN KLEIN: Correct.

MEMBER McCORMICK: Okay, that is
a significant take-away.

MEMBER BERG: In the early days of the internet, the only necessary app was email. And look what that led to. Sharing files and --

MEMBER STEENMAN: And to add to your statement, Hans, this DSRC is only applicable to safety because there is a very viable alternative for almost anything else. That is well-established and available.

MEMBER SCHROMSKY: I think one of the things that gets us off on tangents on this is the word apps. I think what you are saying is a V2V platform enabled by DSRC technology. Apps were built on top of that platform. The apps reside on top of platform.

We say DSRC apps. An app is an app. I don't call one app between another app. It is an application.

I think what people are trying to do is enable a platform that enables safety.
Now if anybody wants to build on that, God willing, but I think it is a platform that we are trying to establish our framework compared to an application.

I understand where you are going where it enables it. The platform enables the application. The application doesn't enable the platform.

MEMBER McCORMICK: And the other thing, until we actually have something that we can go look at, this is kind of premature. To his point, we have no network. So if we develop a bunch of apps, we would just be demonstrating it in the lab, essentially or V2E.

MEMBER CAPP: So the question is would we want to ask the DOT to look for non-safety apps as a means of accelerating deployment? That is a fair question I looked at a lot of times. I don't know if that is one we want to ask them to --

MEMBER McCORMICK: We don't even
know how much the bandwidth we need yet. I mean, by the time we get the results back to signify it, I'm not sure we know from a DSRC spectrum how much we really need.

Do we need to make it by the car or are we going to just crash the whole thing because we need too much?

So I wouldn't want to go asking them to do that until we were sure.

MEMBER CAPP: I was kind of interpreting this as restated that way. Are there other apps that they should be looking at as a means to accelerate the point?

CHAIRMAN DENARO: Well remember this came from our discussion yesterday about the vulnerability of DSRC and the spectrum sharing discussion.

In one of the discussions we said gee, if we could get -- there are a couple of things. We need to make sure that -- we said that there are two things. One is you need to make sure you do extremely thorough
testing. So we are acknowledging that yes, maybe you can share this but you damn well better prove that it doesn't interfere.

And then the second thing we said is it would be extremely useful to get near-term utilization on this channel because that is the whole reason it is being attacked in the first place and we don't have an answer for that. So that was the whole impetus which got us to this.

Now with the light of a new day, we are sitting here saying yes, the DSRC-necessary apps is a null set beyond safety.

So let's say for the sake of argument, let's just drop this. Is there something else we can recommend that gets early utilization of that channel?

MEMBER McCORMICK: Well so the proper recommendation is to advocate for V2V and V2I for commercial vehicles.

CHAIRMAN DENARO: And they shot that down.
MEMBER McCORMICK: Well I don't really care if they are going to shoot it down. It is still a recommendation that this committee may make.

CHAIRMAN DENARO: Okay. So maybe we need to go in that direction.

MEMBER McCORMICK: We have a right to have a bad idea.

VICE CHAIRMAN KLEIN: Such apps might target commercial vehicles and might be implemented on the app.

CHAIRMAN DENARO: Why don't we go get our lunch and we can come back. And if there are those who need a break, fine, but we can kind of talk over lunch, too.

(Whereupon, the above-entitled matter went off the record at 12:15 p.m. and resumed at 1:08 p.m.)
A-F-T-E-R-N-O-O-N  S-E-S-S-I-O-N

(1:08 p.m.)

VICE CHAIRMAN KLEIN:  Okay, let's continue the fun and games.

Okay, next recommendation here.

CHAIRMAN DENARO:  Now do we want to --

VICE CHAIRMAN KLEIN:  Continue with the previous one?

CHAIRMAN DENARO:  -- continue with the previous one.

VICE CHAIRMAN KLEIN:  I would just make consensus on the previous one.

(Pause.)

CHAIRMAN DENARO:  We are just trying to get a couple of our stray cats back in.
We might be getting stuck on this one. But before we leave it, I wanted to ask a question. With respect to the DSRC-necessary apps, we concluded briefly before lunch that that was a null set besides safety. But if we focus on all the unique features of DSRC, one is for low latency for which I think maybe safety is the only one vehicle to vehicle but what about the fact that it has very good security, privacy, and I don't know if there is an advantage --

MEMBER BERG: No subscriber fee.

CHAIRMAN DENARO: I'm sorry?

MEMBER BERG: No subscriber fee.

MEMBER CAPP: Yes, maybe just word it a little different. It could be used as explore other such applications to take advantage of those benefits as a means of helping deployment and warning of the spectrum.

CHAIRMAN DENARO: Yes, I mean there might be applications that really
benefit from the privacy and security because of the nature of what is going -- and we are talking about a V2I thing because the whole problem is we are not going to have sufficient V2V. So are there V2I applications that are best not done on cellular? Let's put it that way.

MEMBER BERG: For the reasons of privacy, security, zero subscription fee?

CHAIRMAN DENARO: Yes.

MEMBER McCORMICK: I guess I would be a lot more comfortable if it said safety apps than just DSRC-necessary. Because the last thing I think we want is a proliferation of non-safety apps of spectrum that we don't know if it is capable of handling just those right now.

CHAIRMAN DENARO: No but going back to the original intent of this thing, and I am trying to figure out if there is a recommendation in the haystack here of the fact that we are looking for some early
utilization of the channel so something other than V2V because that is going to take so long.

So it is really a V2I app that in fact does benefit from the DSRC formulation.

Then like I said, I was focusing only on the latency when I was thinking about it before lunch but there are these other characteristics of DSRC. I mean, I don't know, I am making this up but if my bank were to send me my latest statement, I would like that over a very secure network.

VICE CHAIRMAN KLEIN: So one possibility is you have got a technology, DSRC. It is a channel. It does -- it has certain characteristics that are unique. There is a dozen of us here trying to think what could you really do with that. Or like gee, I am not really sure. I don't know. From which we cannot, however, conclude that no one can do anything with this channel.

So what you do, one possibility
is, you say to the entire world, we have got a new channel out there. If you can do something with it, it is an opportunity. It is an incentive for innovation. Take it and run with it.

Bob can do a hackathon, possibility. It is a scary word when it comes to vehicle automation but nonetheless, folks, there is a new platform over there. Half the developers they hear the word new platform and they run to be the first one there to get something from it.

CHAIRMAN DENARO: We might not like hackathon but at least I didn't say killer rat.

MEMBER McCORMICK: Rather than asking the DOT to host a hackathon, which that might be a bit of a stretch for them --

VICE CHAIRMAN KLEIN: I don't know. They have done it.

MEMBER McCORMICK: Well, I was thinking that a near-term less expensive
process would be to then just attend things like DEF CON and present to people the situation coming up. That community voluntarily will go off and try to hack it. You know, provide a mechanism to keep your enemies closer.

CHAIRMAN DENARO: No, no, no. You are misinterpreting what we mean by hackathon.

MEMBER McCORMICK: Oh, okay.

CHAIRMAN DENARO: The way Silicon Valley is using this is people get together after work around 6:00 or 7:00 p.m. and they work until 7:00 a.m. the next morning, all through the night. And it is a bunch of software guys and they come up with applications -- they write apps overnight, present them in the morning. And some kind of award goes to the best new idea.

MEMBER McCORMICK: Yes, that is not a hackathon. A hackathon attempt is to break the integrity of a system.
VICE CHAIRMAN KLEIN:

Nomenclature. Nomenclature. Let's say that they are both right.

Okay in any case, the fact that the association of hackathon with damaging a system we don't want to have that association at all. So instead of a hackathon, we could say to host an application development contest.

MEMBER McCORMICK: Perfect. I mean whether they call themselves hackathons or not, it carries a connotation to the nontechnical world what they are doing.

MEMBER KENNER: And a contest of course already exists with model employment.

MEMBER McCORMICK: Right.

VICE CHAIRMAN KLEIN: For DSRC?

MEMBER McCORMICK: Yes.

VICE CHAIRMAN KLEIN: Oh, then it is okay.

So that is kind of new interesting. There is an application
development contest used for the DSRC platform.

MEMBER McCORMICK: Yes, Jim Sawyer actually oversees that.

VICE CHAIRMAN KLEIN: So the null set is not accurate.

CHAIRMAN DENARO: No, you are still talking about necessary.

VICE CHAIRMAN KLEIN: No, basically these were -- were these DSRC-possible or DSRC-necessary? Maybe that is too --

MEMBER McCORMICK: I don't know they just said here is the protocol. What can you do with it?

VICE CHAIRMAN KLEIN: Because it is a business -- potentially a business opportunity.

Another thing, you know every recommendation starts "U.S. DOT should." But really in the case of DSRC, private sector, it is a governance question but it is highly
likely it is going to be Ford and GM should or whoever should. Right? It is a private sector system or is likely to be a private sector system.

CHAIRMAN DENARO: Yes, but this letter is to DOT and we are sending it to encourage.

VICE CHAIRMAN KLEIN: And encouragement includes encouraging the folks who actually operate the system.

CHAIRMAN DENARO: So it would seem wording number one is probably doable.

MEMBER McCORMICK: Yes, I think the most important one was actually finished the development during that exercise of a work zone awareness act. That is a work zone coming up and was done very quickly. And it was perfect. I mean because they do do that. Whether or not that was done as part of the task order that the DOT gave them or not and now it is done, as opposed to what this statement says is that we should
continue doing it, is how I would like to see it read.

CHAIRMAN DENARO: Well, there is a twist here and that is to do one of these things where you focus on exploitation of the unique features of DSRC. So in other words, apps that are best done on DSRC versus --

Anyway, there is two listed here. One is the DSRC-necessary app. The second thing is something to do with commercial vehicles. So are we starting as a committee here to wordsmith this and we should just tell your subcommittee to go away and --

MR. BELCHER: I think the commercial vehicle, I thought we reframed it to looking for opportunistic situations. Because I think there are other. I mean commercial vehicle can be an example but it is not a place to go necessarily. There are toll authorities to go. There are taxi cab companies to go. There are trend operators to go. There are cities to go. They are all
equally viable.

CHAIRMAN DENARO: Well should we list some of those or just not --

MEMBER McCORMICK: Actually if we move commercial vehicles, I think we should just expand it as such apps or examples.

CHAIRMAN DENARO: I think there is value in having that short list in there, as opposed to just say go do good things.

Okay, so I don't want to beat this to death. Any more suggestions on this?

VICE CHAIRMAN KLEIN: On the second one I think brevity is a positive thing. We could almost delete the second one.

MEMBER ALBERT: I don't think you should.

VICE CHAIRMAN KLEIN: You don't think so?

MEMBER ALBERT: My rationale, if you look at the evolution of the ITS program, one of the more successful things I think
that happened were the early deployment planning grants. And as you all heard Ron say, you know seed money is something that is very important. Also what is important is that was learned, I think, through the EP, early planning grant process was that institutional issues were a major challenge. And that having pilots like we are suggesting here help not only in seeing how things might be applied, it also would be getting buy-in at the state and local level, where things are actually going to be implemented. Maybe less so at a federal level by federal government.

So I would really like to see the second one stay but I would also like, similar to what we just did with the parentheses in the previous one, maybe to add somewhere in there where you say pilot deployment, saying rural, urban, regional. I got the rural thing in there.
going to let him leave today unless he --

Two comments about that. One is I don't think it is our place to tell the DOT to go seek federal funding. I think it is sufficient for us to day should perform or implement additional pilot deployments or whatever, funding is their problem -- first comment.

The second comment is we did hear yesterday from Brian that they are doing precisely this and regional things and different things. So what are we suggesting that is different than what we heard?

MEMBER BERG: Can't we just say we agree with what they are doing?

CHAIRMAN DENARO: Is that a recommendation?

MEMBER BERG: Well say why is it doing more pilots? It is not clear why we think they need to do more pilots.

CHAIRMAN DENARO: I didn't hear -- understand.
MEMBER BERG: Additional pilots.

CHAIRMAN DENARO: Yes.

MEMBER BERG: What is our reason for asking DOT to do more pilots?

CHAIRMAN DENARO: Yes, what specifically are we asking? Yes.

MEMBER ALBERT: I think quite frankly, when you have more pilots, if you look at the early deployment planning grants, they went from major metropolitan areas down to middle-sized metropolitan areas. And when they provided this funding, something happened. And one of the things that we know that in getting anything deployed, it ends up being kind of a peer to peer relationship. State DOT calling other State DOT. And so if you have more pilots, you have more chance to access that peer to peer network of professionals and having just one or two or three that then people say oh, that was nice but that is not me.

MEMBER BERG: Maybe it is just
about infrastructure even.

MEMBER ALBERT: Maybe, yes.

MEMBER BERG: Because that has probably not been sufficiently piloted, all the different things.

MEMBER ALBERT: Right.

MEMBER McCORMICK: I would submit that the purpose of the second one is the second line, is that we want them to do more to educate local officials and local publics about the benefits for which an example of what you might do are those pilots, demonstrations, informational things.

Rather than start with here is the answer, it is like here is what we think you should at higher level strive to do. And here is suggestions on how you might be able to accomplish that.

CHAIRMAN DENARO: Yes, I can see it either way. I have no problem with that.

I guess part of what I am looking for, is there anything -- I mean you did say
-- what did you say rural and regional. Is there any more specificity that would potentially be recommending in a direction we don't believe they are going right now? That is my question. Or maybe we don't know that.

MR. BELCHER: I guess Brian, are any of your pilots intended to be multi-

MR. CRONIN: I would think so.

CHAIRMAN DENARO: But you don't know so.

MR. CRONIN: We don't know until we put a solicitation out and the best people apply. I mean --

CHAIRMAN DENARO: Oh, I see. I see, okay.

MR. CRONIN: Yes, I mean our expectation would be. I mean we are multi-modal program and we are funding application development. We are funding freight stuff. We are funding all the different modes. Well not all of them.
MEMBER ALBERT: Brian, is it fair to say that you have not done one in a rural setting?

MR. CRONIN: Yes, I think so.

MEMBER ALBERT: There is a gap. But I don't want rural just to stand out. Of course, twist my arm. But I think you are just defining the context to see where it goes.

MEMBER McCORMICK: Well actually that is a skirt of the rule in the rural roads, although it is less EDW.

CHAIRMAN DENARO: Part of what we are doing then here, since the solicitation, I guess we are going to go backwards. We are creating a checklist. And so we, the committee, are saying -- I don't mean to word it like this but we are saying you are going to get these proposals back. If there isn't a rural one in there, we are saying there should be.

MEMBER ALBERT: Right. And if
you are looking at safety, 60 percent of the fatalities are in rural areas.

CHAIRMAN DENARO: We have got your numbers.

VICE CHAIRMAN KLEIN: So the rural is there and multi-modal isn't.

MEMBER McCORMICK: Well wait a minute. Does that mean we have got to put DSRC in the factors?

VICE CHAIRMAN KLEIN: In the what?

MEMBER McCORMICK: Factors. Ton, those factors are all the rage.

MEMBER STEENMAN: Absolutely.

CHAIRMAN DENARO: I just heard about automated or autonomous, I'm not sure, but autonomous tractors in Russia plowing entire huge fields.

MEMBER BERG: John Deere actually has a research program. And Caterpillar just said in the Wall Street Journal they have mining stuff -- haulers. Autonomous.
MEMBER ALBERT: So if we really wanted to effect change, we could get our lawnmowers to do our yard.

CHAIRMAN DENARO: It's like that little vacuum cleaner thing. Yes, exactly.

VICE CHAIRMAN KLEIN: Okay, does this pass to the next --

CHAIRMAN DENARO: I think it needs some words but let's move on.

VICE CHAIRMAN KLEIN: Yes, definitely it is not complete.

Okay, connecting federal and local agencies. Given their key role in the implementation of ITS, state and local official should have a greater voice in U.S. DOT's technology programs. Hierarchical federal program structures should be complemented by peer to peer program structures, like we see in AASHTO and in the TMC Operator's Association and both types of programs should connect. So federal programs should seek ways to connect even more
effectively with state and local peer to peer associations.

So this is a closer integration. This is the attention in every research development program, which is getting the people developing the technology as connected to the people on the ground who are actually going to use the technology as possible.

And part of it -- we can almost say this. Part of it might be also getting the AASHTO and the TMC Operators Associations reaching up more as well. That is kind of a two-way street.

MR. BELCHER: I think there is a fair amount of that already. So I guess I mean I know that the Joint Program Office has a great deal of interaction with the state. So are we just supporting that and saying you need to keep reaching out to stakeholders? Is that what we are doing?

MEMBER CAPP: Including, what are they, once a year ELT meetings, the SNAPFO
DOT -- it is a -- there is a few forms of it are actually are now questions. Is it sufficient in that way.

CHAIRMAN DENARO: So is there something missing that we know about?

VICE CHAIRMAN KLEIN: In one of the discussions that we had in our committee, which was kind of drawing on our experiences in this room over the last two years is we are dealing -- in this room we have the most outgoing technology development representatives and the most technology oriented state and local officials. And even here, the communication has not been easy within this committee of however many we are, 18 or 20 or something like that. And this is the best possible scenario you will ever have for communication between the R&D community and the future implementing community. And it is not that easy.

So if you extrapolate to the folks who aren't predisposed to communicate,
it is a big gap. It is now -- it may be --
that is not to say that the efforts are not
being made and maybe the efforts are damn
good and maybe they are not going to be much
better. That is a reality. But in part, we
are recognizing wow, there is a gap between
the development community and the
implementing community. And that is
potentially a problem.

If it is a problem, that
something more can be done about -- we are
making pretty vague recommendations.

MEMBER McCORMICK: Well I guess
my question is what is it that is achieved by
doing this? I mean, there should be a
purpose for recommending it. And although it
is obvious and maybe intrinsic to our
understanding of it, we ought to be stating
that as researchers we need to do this so
that you will get their input, capture their
regional, or their road structure, or
whatever that is. We have got to have a
reason for saying in order to make a more robust program that covers all that --

VICE CHAIRMAN KLEIN: The classic distinction is that the implementers have profound knowledge of conditions that are reality on the ground, conditions that must be met, the constraint they operate under, and so they are speaking the language of local contests. We talk about what you can and cannot do with the signalization control monitors.

MEMBER McCORMICK: I think that is the perfect way to preface it.

VICE CHAIRMAN KLEIN: And then there is the language gap as well. So how do you -- so getting the voice of the locals up at the research level, and then getting the voice of -- for instance one of the words we use here a lot is latency. I will bet you a lot of money that 99 percent of local transportation officials don't know what that word means. Would you concur with that?
Latency is an essential word to everything we are talking about here and to networking. It is not a well-known word outside of the information technology community.

MEMBER ALBERT: I think we were also thinking that things need to happen vertically and horizontal --

VICE CHAIRMAN KLEIN: That is the next point, yes.

MEMBER ALBERT: -- so that the vertical thing, let's say for AASHTO is connected vehicle on the AASHTO executive team's agenda. How much do they know about it? If decisions are made vertically, should we include, even as an outreach to the governor, like Western Governors Association? I mean DOT directors work for the governor.

So we were thinking that to effect change, many times it is from the top down. But actually there also needs to be a horizontal that is peer to peer so that the
people who are actually implementing are
talking as well.

CHAIRMAN DENARO: I can give a
case study.

MEMBER McCORMICK: And that was
the TMC Operators.

CHAIRMAN DENARO: Let me give a
case study example. And then my question
would be so what additionally should be done
to fix that?

Monday on the way down here, I
was invited to give a speech at the ITE
annual meeting in Boston. It was Shelley Row
who was running a session.

Now I am just repeating what I
heard. She was told that the reason for
having myself and a few others on this panel
was to talk about connected vehicles and
automated vehicles because "this community of
transportation managers and so forth are
totally clueless about connected vehicles and
automated vehicles; in fact, often don't know
the difference."

And so our job was to bring them up to speed on all this and the subtitle to the session was what does it mean to me. Connected vehicles and automated vehicles: what does it mean to me?

So there is an indication that this AASHTO communication and whatever else is happening is not penetrating all the places it needs to, if it is in fact true that these people are so clueless.

Now, in the meeting and after a breakout session, there was a guy sitting there and he said let me tell you an example of why this stuff, this ITS stuff is going nowhere. He says I am the CEO of a little company called Green Driver. And we have this really cool app that can help you in your car and your phone find the optimal speed to negotiate a bunch of traffic lights on the street. So all I need is the stat data on all your lights. I can write this
And it was not just that. It was not just the green flow, it was also about if I know the light is not going to change for 30 seconds, then I can go do a text or something while I am waiting and it will give me a buzz when the light is about to go, whatever.

So we talked about this. George was talking about this also. He said he would go into a particular city, first of all to find the right person to talk to about getting that data. They all said all the data is readily available. He said fine. Try to find the person who can tell you how to get that data. Then when he managed to find the person, he had to figure out they had to decide that it was okay to give them the data, even though they said it was available. Then he had to worry about the format the data was in and then how he was going to deal with all of that.
He said the bottom line is for his little company in three years, he was able to work with six different cities so far. And we kind of did the math and what it is going to take him to get to 150 cities.

And so one of the conclusions is, as everyone in the room discussed this was gee, if we could all talk together and create some kind of standards so that is data all looks the same then a company like that comes in and once he has done one city, boom, he can roll off 400 others.

So there are some practical examples of ITS literally an entrepreneur who may go out of business because of the friction in the system for him to make progress.

So, in spite of this communication and what is going on, somehow it is not adequate and something is missing. And the question is, is there a recommendation buried in here someplace?
VICE CHAIRMAN KLEIN: It sounds like there is a need for a recommendation. You sound like you are concurring there. We need a better crafted recommendation.

MEMBER McCORMICK: Well I think that is really what is follow-up to what this is talking about. I mean this is probably what I had asked Ken. I said do you guys brief AASHTO's Subcommittee on Systems and Operations Management? You know the SSOM is all of the TCM guys as well as from rural communities, as well as from everywhere else, all of the people that are involved in this space with the maintenance and the implementation of systems and technology. And they are the ones that are going to be eventually the owners of all this infrastructure that is put out. It has got to be integrated into their boxes. It has got to be using their feeds. It has got to be using their power and their old MEMA enclosures.
So there is a huge concern on their side when they get exposed to this like well look, I am going to have to train a whole bunch of people. Granted, it might be years down the line but that is a multi-year program for them to get people capable of managing this. And then they may, when we put in the first infrastructure communication device what the proving center, we had to have city to county to state, everybody blessing what was going on there and everything else. And those were the people who knew how to manage that. You know, it was like here, can we just put it in? I'm like no, we have got to go with 47 approvals.

So I think this thing what it is saying is a very, very valuable statement that says given that they have this knowledge, ability, this expertise, and will have the eventual responsibility for the maintenance of these ongoing systems is that there should be something, I don't know what
that is, some dedicated communication activity going on to get them informed and make them aware of what may come down the pipeline.

I think that is a very valuable recommendation, whether or not --

VICE CHAIRMAN KLEIN: And then the question is does it, would the ITS verify it? There are mechanisms in place.

MEMBER McCormick: Right.

VICE CHAIRMAN KLEIN: So does it come down to please keep up the excellent work or is there something more? This is a discussion for the whole committee.

CHAIRMAN Denaro: So George, how much JPO V2V, DSRC information flows to you through official channels into your office in Palm Beach or wherever?

MEMBER Webb: Very little. But to me, personally, because of my activity on various committees including AASHTO committee, yes. But as far as stuff like
that, I mean, this is the IT magazine for this month. It talks about technology and future of transportation. And it has got articles on introduction to cyber security, the evolution of the connected vehicle technology from smart drivers to smart cars, the revolutionary development of self-driving vehicles, and implications for the transportation engineering profession.

The next step in transportation engineering, to find decision support systems to integrate corridor management, the Dallas and San Diego stuff. So lots of good information that they are distributing to their members.

Now JPO has reached out to AASHTO years ago and AASHTO has been significantly involved in this process. There are probably a dozen key major states, everything California, New York, Florida, Michigan. There is a bunch that are there.

And they have even gone so far as
to also contribute state money, some of that -- a subgroup of all those states to be a pool fund, so that they are then doing an operation among themselves working with JPO and getting grants and having tasks associated with the whole connected vehicle stuff.

So AASHTO has been really involved, including my understanding up the leadership at AASHTO. Now there are going to be some changes at the AASHTO leadership, so they have got that issue to deal with, too.

But they are aware of it but the ongoing question is similar to the questions we had here. So when is the timing? What is all this? When are we able to do something? And the fear is also there about when I take it back to my state, I have got to be able to show that the investment in this is the right way to go versus continuing to invest in maintaining our bridges and our roads and so forth like that.
So yes, I think that there has been a good involvement. In fact, the JPO went so far as to say you know, hey AASHTO, we want you to reach out and get local government representation. So they reached out to me. So I am a local representative on the AASHTO group working on this stuff, going back to DII and that kind of stuff.

So there has been a lot of activity, a lot of knowledge, and there continues to be. I mean I don't know how many different programs they are currently doing as far as investigating stuff.

CHAIRMAN DENARO: Well it sounds like it is working.

MEMBER WEBB: But I couldn't tell you from the standpoint of distributing beyond that dozens states exactly what is happening. I couldn't tell you that even though Texas has representatives that sits on the committee what the feel is within Texas as far as how they distribute it even among
their own regions, you know, within the State Department of Transportation or any of the states, including Florida, from that standpoint.

CHAIRMAN DENARO: So is there a recommendation in here for JPO to do an audit of 50 states and figure out whether the message is coming through or not?

MEMBER WEBB: Maybe the paragraph could be softened to say continued versus --

CHAIRMAN DENARO: So we will work on it.

VICE CHAIRMAN KLEIN: Yes, we will work on it. Or maybe it is there is no disagreement that this is a big challenge in any big program. The only question is, and there is no disagreement but a lot of efforts are being made. So the question is can any one of us identify a specific place where more effort should be made?

MEMBER BERG: Just like a pilot case, some test case to say will this method
work. You don't have to do it over the whole country at once.

CHAIRMAN DENARO: You know, this reminds me that a long time ago in the early days of something called GPS, I was asked by NATO to join a lecture series around Europe. And we went to all these different countries and really had top officials and everything and briefed them all about what GPS was about and everything else. And the countries we picked were all the ones who were not engaged in GPS. We didn't go to Germany. We didn't go to France. We went to other countries, Turkey, and Greece and Portugal, and all the places where it wasn't happening.

So I mean the analogy here is there is the 12 states or whatever that are greatly invested. Maybe there ought to be a targeted outreach with AASHTO possibly but to the next tier or whatever.

MR. BELCHER: So in AASHTO all the states get the message. I mean because
they are briefed on it at their federal meetings, at their national meetings, and at their regional meetings. And so whether it gets down, that is a different question.

You know the local government is a lot harder because there are so many more of them. And I think Steve's comment is a good done about the public interest groups. That is an audience that we don't generally target. And so the Governors Association and the Conference of Mayors, the International what is it ICMA, city managers, those are people who don't necessarily have the direct transportation responsibility but should be aware of this.

MEMBER ALBERT: Would you call them nontraditional stakeholders?

MR. BELCHER: Yes, that is probably as good as any.

And it just takes so much time. I can't tell you how many times I speak a week and how many times I am speaking and I
see these guys on planes speaking. So I think the nontraditional stakeholders is maybe might be a way --

CHAIRMAN DENARO: That is a great suggestion. Let's formulate a recommendation around that. And let's do a such as thing again and list some of the ones you just said.

MR. BELCHER: If I could, the thing I would do is would expand active vehicles. Because I think the deployment technologies are far, far, far more important.

CHAIRMAN DENARO: I agree.

VICE CHAIRMAN KLEIN: The ready to deploy technology program. They are the only ones that are relevant to public officials.

MR. BELCHER: Right. And so telling them about something that is going to happen in five or ten years isn't helpful.

CHAIRMAN DENARO: So do a such as
and have them pull up that list.

VICE CHAIRMAN KLEIN: I want to test that last one. Should focus on ready to deploy. When you are dealing with deployers, they want to hear about ready to deploy. And then the nontraditional --

MEMBER ALBERT: For nontraditional stakeholders.

VICE CHAIRMAN KLEIN: Okay.

MEMBER WEBB: I serve on the National Association of Counties Transportation Steering Committee. And the typical county that sits on there is 50,000 to 75,000 people. So they are very rural from that standpoint.

So when I get up to try and talk to them I am trying to say okay how do I boil this down to what effect is it going to have in our community and it means to you from a budgetary standpoint. And so my speech is very short. It is commonly out there. We are still working on it. I will let you know
next time we get together. I mean that is pretty much the same speech I have been giving for the last five years because there is nothing to have the direct effect that means something to them from a budgetary standpoint, staffing, whatever as far as their community is going to be.

I mean we can tell them that -- I mean it is an easy summary. I mean it is like you know they were working on technology. So the cars talk to each other and the cars talk to the traffic signals and the roadside, and this thing will improve safety. And they go oh, okay.

MR. BELCHER: Are you talking to them about other technology, traffic signal technology, dynamic message signs?

MEMBER WEBB: No.

MR. BELCHER: Applications, making data available, management?

MEMBER WEBB: No.

MR. BELCHER: I mean all those
MEMBER WEBB: Well again, a community of 50,000 to 75,000 for a county, there is not a whole lot of those. I mean the more sophisticated counties that have issues that can use that kind of stuff, I think already know and they are able to get into that.

So my target items for that group is very tough to talk to because I don't think there is anything for me to give them. And I want to just explain it. So it is just not ready yet. It is not having an effect.

You know, it is not going to affect them as yet.

VICE CHAIRMAN KLEIN: And that is the local voice is that is such a crucial but obvious insight that the people who are deploying, it has got to be ready to plug and run. Otherwise, you read about it. It is
interesting to read about it but it is not quite there.

What are some examples of nontraditional stakeholders?

MR. BELCHER: National Association of Accountants, National Conference of Mayors. I mean it is public interest groups, really. It is political folks who have the ability to spend meeting.

MEMBER WEBB: Conference of Mayors and also just the leader of cities. I mean that covers it all. It goes from the city to the county to the governors.

MEMBER McCORMICK: What about the first responders, the police, the ambulance, firefighters?

MEMBER WEBB: Well certainly they work for cities or counties.

MEMBER McCORMICK: Okay, good.

MEMBER WEBB: Having the Commissioner go through one of these meetings and hearing a presentation a few minutes how
much it gets back to other commissioners that aren't there, for the staff or whatever, you know.

VICE CHAIRMAN KLEIN: Okay, so what is it? The league of mayors?


CHAIRMAN DENARO: Okay.

MEMBER McCORMICK: Except for Detroit. That is a bit more fluid.

VICE CHAIRMAN KLEIN: Okay, again the local angle. Local incremental innovation.

Implementation, be it of ITS or any other innovation, involves an understanding of local operating conditions. Innovation studies have identified two models of innovation, a local incremental model, and a laboratory advance model. Both models are important.

The federal ITS program excels at
the laboratory advanced model, yet much ITS implementation is located in our local -- many ITS implementations are local in origination. An example of this might be electronic toll collection and how that came to be adopted into use.

Greater support is needed for the local incremental model of innovation. So recommendation one, U.S. DOT should further their capacity to identify and diffuse local innovations. This is sort of a facilitative role.

Number two, U.S. DOT should provide seed grants and other modes of support for successful innovations, even if they originate locally outside the federal program.

The insight here is that there are potentially high yield innovations, even though they are sometimes technologically modest. They are quite useful at the local level. They are using information
technology. And facilitating that those innovations happen and that when they happen good ideas or new systems get diffused out to other users in the local community, other operators. That can be an important function at the federal level.

So it is not just that at the federal level you are doing advanced technology that is a few years down the pipeline but there is even the federal level should be looking at relatively modest but potentially powerful innovations that work in one spot and then helping them to diffuse outwards.

We, in our discussion, we used the example of the discovery that washing your hands significantly improves public health. That is such a modest insight that any researcher would be embarrassed and any biologist would be embarrassed, wouldn't consider that worth their time. And yet, an innovation like that historically, when it
was diffused, had enormous implications for public health.

So we are trying to think of an example in the ITS world. Maybe it is electronic toll payment. At the end of the day it is not that hard to implement but it is a big deal. And to the best of my knowledge, a lot of the initiative happened at the local level and then it diffused laterally and has been beneficial all over the place.

That kind of model, a local innovation diffusing laterally, high benefits, even if it is not high tech, that is a role for the feds possibly to facilitate those diffusions.

And this is the stuff where your local guys, the deployers, their only question is can I use this today. Otherwise, I am a busy person. I can't talk to you. These are almost always innovations that yes, they are ready to deploy because a thousand...
miles from here, someone already deployed it and it worked.

So this is again, in some ways this is, and it varies from sector to sector, sometimes this is the more important innovation model. This is where if you look at in your own life change that you experience often happen this way. And a lot of internet-based innovation happens this way, like the parking app gets implemented in one city and they kind of work out the kinks and after a while they have got a pretty good parking system running. It is not that high tech. It is just a website that has high benefits. How do you diffuse that?

MEMBER McCORMICK: I am good. I would like to declare victory and move on, unless somebody else objects to it. I think that is well-written and covers it.

VICE CHAIRMAN KLEIN: Oh, come on, let's have a little spar.

CHAIRMAN DENARO: Don't take a
yes when you can get an argument.

VICE CHAIRMAN KLEIN: Okay.

Okay, you had your chance.

Okay, this is the last point.

This is coming back to our deployment incentive report. This is in fact a kind of not -- so this is not so much a recommendation. This is almost a separate deliverable that we are committed to, which is providing feedback, a recommendation about employment incentives.

So two of the subcommittees met and discussed this, the Communications Subcommittee and the Implementations Subcommittee. We talked about the deployment incentives.

So there is two general recommendations here. The first one concerning deployment incentives: U.S. DOT should inventory the incentives it currently uses and should assess their suitability for ITS deployment.
So making a list and identifying what are the incentive mechanisms that are already being used. What are the grants out there that already exist? And how applicable are they to ITS deployment?

So that is a sort of stock-taking.

CHAIRMAN DENARO: Incentives currently in use for what? Incentives for what?

VICE CHAIRMAN KLEIN: Actually incentives for pretty much anything. An incentive for using a different grade of asphalt might actually be used as an incentive for upgrading your TMCs, releasing your --

CHAIRMAN DENARO: Transportation incentives or --

VICE CHAIRMAN KLEIN: Yes. So this is U.S. DOT should inventory the incentives --

CHAIRMAN DENARO: Its incentives?
VICE CHAIRMAN KLEIN: Its incentives. The incentives it currently uses.

CHAIRMAN DENARO: Got it.

VICE CHAIRMAN KLEIN: Although you know there might be --

CHAIRMAN DENARO: Oh, I see.

VICE CHAIRMAN KLEIN: You can scan them anywhere you want. It might turn out Department of Defense has incentives that are very powerful and applicable to the --

CHAIRMAN DENARO: Don't go there.

VICE CHAIRMAN KLEIN: No. Okay, now the next part is more of this was our brainstorming. We just made a list of as many incentives as we could come up with.

U.S. DOT should consider the following deployment incentives. And we pretty much all came up with money as the first incentive.

(Laughter.)

VICE CHAIRMAN KLEIN: Throw more
money at the problem, achieve the high level of consensus.

Now moving on from that valuable insight, we came up with other ideas. One is grant parameters. Right? So even if there is not more money, you can make it a little easier for existing money to go over to ITS so you can tweak the eligibility criteria for matching grants. So you ease the criteria for ITS, maybe it is easier to fulfill the match requirement, something like that.

The IDEAS program, which is Innovations Deserving Exploratory Action. Something like that could be expanded or applied to ITS. I understand that is a relatively modest program with potential.

Grant percentages. You could have greater federal percentage when a project is doing an ITS deployment.

You could do possibly cross-modal coordinations, pool funds across different agencies, particularly when you are doing
cross-modal systems, multi-modal systems might qualify for multi-modal funding and support.

We talked about intellectual property incentives that -- I don't know to what extent this has been used in transportation. It does appear to figure prominently in NIH and biotech. It figures in Universities somewhat that a researcher who gets federal funding to do research gets their own private property in the results and, therefore, they can try to start their own company, based on federally funded research. And to a certain extent, these policies already exist.

The idea on the one hand it is like hey how come some private person gets to profit from public funding but he logic behind it is it is really hard to get ideas out in the field. And you need some pretty powerful incentives sometimes to move ideas out. Why not hold out a big fat carrot to
get some researcher to work their tail off for three to five years, try to start their own company and get the idea out into the mainstream?

CHAIRMAN DENARO: The SBIR program does something like that.

VICE CHAIRMAN KLEIN: Yes, I think this is around.

Now some industries are better suited than others for this, going from the research lab to the market. Biotech is the poster child for this model.

Promoting spinoffs is the same thing. You know if there is a smart person working somewhere and they have got an idea for an app and they are just not getting traction, make it easy for them to spinoff and start their own company. When somebody announces they are quitting to start their own company, hey, that is great. We want to fund you!

MEMBER McCORMICK: I'm curious.
When you are talking about promoting spinoffs, what you just described sounds as if somebody is working for somebody and spins it off from there. Most companies have some encumbrance over the intellectual property you have developed at their company.

So I think in terms of saying promoting spinoffs, it might more sense to characterize it differently, so that you are not violating some corporate partial or full ownership of that intellectual property. You know, promote startups would be much less reactionary saying Bob developed while he was working for Navtech. So he is going to take all that time and effort to spin off his own company and then he is going to get sued by Navtech for stealing a product that he developed during his time there.

VICE CHAIRMAN KLEIN: There is another model. Because some companies, when they have got somebody who wants to spinoff, instead of suing them, they fund them and
take a position in the firm.

MEMBER McCORMICK: Right but given the laissez-faire form of economics that this country operates under, there is no one way that I would want to recommend that is not funding startups but promoting --

I understand what you are trying to say. I just don't think the language is appropriate.

CHAIRMAN DENARO: I agree with what you are saying.

VICE CHAIRMAN KLEIN: Do you think the spinoff word is to be avoided or probably have a spinoff/startup?

CHAIRMAN DENARO: I don't think you need a spinoff. I think Scott has a good point. There is a little provocation.

VICE CHAIRMAN KLEIN: Okay, continuing on our list.

Data access to developers, this is your app developer there, that the open data is a huge incentive. Every TMC in other
areas, every automobile is loaded with data that somebody could make a lot of money off of. And if it is made available, there is an incentive of essentially, guys we have got a pot of goal. We think it is a trash can you think it is a pot of gold. So take our data. We are not doing much with it. And that is the incentive. And you are going to make some money.

MEMBER McCORMICK: Okay, on this one, I just gave a number of presentations on data ownership. And while that is a wonderful idea to have open data, who owns the data is really a question that currently has a different answer from every person that has a system. General motors may have -- and I have done this for years. We have had discussions with the OEMs on what data is common, what would be blogged and there is no common frame of reference on that.

And so the other problem is that I will give the example that if I buy a
television that has a remote and I may not want the government or the TV manufacturer or my wife to know what shows I am watching, that doesn't give me right to the data stream coming out of the end of that remote. Because that is probably intellectual property or code developed by them.

And so the reality is that yes, there is a lot of data. In terms of the public entity, there is a lot of data. But we would really have to be very careful to say that really what we are asking to do is to begin a discussion on what data might be potentially available, rather than just saying open data as an incentive because there is no such thing as open data.

Everybody in even some forms of data, if you communicate the data, it now has two owners. And so because of that, and if it goes through a government server, now it is subject to freedom of information.

So there is a real landmine when
you start talking about open data as an incentive. Great idea. It won't happen. It will never happen.

VICE CHAIRMAN KLEIN: I disagree with that because I have been talking with TMCs on this and a lot of TMCs if you want the TMC data from the State of Georgia, call them up and say hey, can I have an account please and send them an email. And they are like well, are you a bad guy? No. Oh, okay.

MEMBER McCORMICK: And if you want to narrow it to public entity data, I think that is fine.

VICE CHAIRMAN KLEIN: First of all open data as incentive is a legitimate term there. Data access development, you know, where possible. There are places where it is going to be harder than other.

MEMBER McCORMICK: Perfect. If you have where possible, that is fine.

VICE CHAIRMAN KLEIN: To the extent possible, something like that. I
think it is implicit in that.

CHAIRMAN DENARO: How are the subscriptions going on 90e?

MR. CRONIN: You send us an email and say what you would --

CHAIRMAN DENARO: Are you getting good --

MR. CRONIN: Yes, we are getting some. I mean we are getting some use from the data we have. I think that we need more robust data sets and then we will get more use.

VICE CHAIRMAN KLEIN: But the first, the question you started to answer, what levels of permission do you require to access the data. And the answer is very -- it is a very positive thing.

CHAIRMAN DENARO: Yes.

VICE CHAIRMAN KLEIN: I have talked, by the way, to app developers and they made a rather counterintuitive claim. They said there is a question well shouldn't
we standardize the data so that it is easy
for app developers to get. And the app
developers are like God, no.

Many of you guys in the public
sector try to standardize something. That
means there is another two years that we have
to wait. Just give us the data. We would
rather have your junk data today and your
perfect data at some future point. Just give
us access. We will clean it up in a week.
Just please give us access to data and we
will make money off it and we will provide
services with it.

CHAIRMAN DENARO: So wordsmith
that one, like Scott is saying. And I think
it is good.

VICE CHAIRMAN KLEIN: Now I don't
know if -- I mean this requires perhaps some
looking into. If TMCs are the most valuable
collections of data, is there anybody that
has looked across TMCs? I'm sure there is
lots of app -- a lot of entrepreneurs who
have been dealing with TMCs and they might have a pretty good sense of the national profile of TMCs.

Let me say one thing. It might be quite interesting to get together a bunch of these guys and say how can we make it easier for you to make money off this data and to get this data out into productive use? What can we do to make your life easier? And they might have some ideas.

MEMBER McCORMICK: I mean first that deals with a lot of people that are small startups, app developers, et cetera, et cetera, looking to figure out how to leverage it. And in one case yes, you have what Georgia has. It is sure, if you want it, we will give it to you.

In another case, you have what Michigan has. You have a guy that developed live traffic jams that not only would show you on your phone what the next traffic jam was, it would determine your trajectory and
just keep showing it to you as you get going.

The problem was that Michigan wouldn't give them any data. You had to buy that from a company that they sold them to in Delaware and pay a monthly fee for it. They didn't want to deal with any of the individuals because they weren't set up to do retail business with developers, right? And so then you had another whole body of data that says no, we are not giving that out because there was some perceived liability.

So the issues is one of state by state it will differ. Locality like he might not want you to have anything in Palm Beach but New York City can let you have whatever you want. You know Boston put out all the data on the bus GPS locations real-time. And within a couple of weeks there was apps for iPhone and iOS that tells you how many minutes before your bus got to wherever you were standing.

So there is that whole variety
out there. I am not sure how you incentivize it because those guys tend to be self-incentivized. They are. They are saying I am going to figure out how I am going to make my next dot com.

VICE CHAIRMAN KLEIN: So again this model of innovation happening at the locality and moving in a peer review basis, it might be that there is all these different laboratories and experiments going on about how to share data from a TMC. And you survey is there a really good model out there. One city seems to be really doing it right. Can we make sure that that diffuses out there so that it spreads? Best practice spreads.

And you have got suddenly deployable systems. You have got an app developer who is eager to make workable, deployable services.

MEMBER McCORMICK: I think ITS is the perfect place for AASHTO to be the one making those awards.
MEMBER SCHROMSKY: The question I have is when we reference this big data, who is storing this big data?

VICE CHAIRMAN KLEIN: Right. So somebody plugs into the Atlanta Traffic Management Center, where do they store that data? I have no idea. Google is one of the companies that has an account.

MEMBER McCORMICK: Some of it is in Cloud.

MEMBER SCHROMSKY: Well I know how it is stored. My point is the data, the question is when we say we have access to all this big data, I'm pretty sure what that data is part of the vehicle to vehicle. Right?

VICE CHAIRMAN KLEIN: TMCs are sensors, roadside sensors.

MEMBER McCORMICK: I'm pretty sure NSA has it.

(Laughter.)

MR. CRONIN: I mean there is data today, which is data that is in
Transportation Management Centers which is sensor-based. Or for transit they have radio-based communications have sent data in. In the future there is V2V but there is assumptions that there is going to be roadside infrastructure that collects some of that. And then it goes to data aggregators, whether that is public or private, it is still to be defined and it is probably both at some sort. And that is a part of a connected vehicle system that is in the architecture but not really talked about or clearly defined. So it is one of our next steps of rolling out.

MEMBER SCHROMSKY: I agree with you. I think we, like I said before, we are getting ahead of ourselves, the V2X. I am just trying to do V2V. So V2V, I just need to talk to you two. I just need to talk to car to car. I don't really need to talk to the other stuff.

So I am not really storing that
data. If you run a red light, I get the reaction. I react. And I'm on my way. I am not storing that information or anything else. I agree with you. Hey, can I extrapolate that and take? Okay, now I have got a roving sensor because now I am piggybacking off and now I am throwing that sensor off. I agree with you. But when I hear big data, this is a one-time transaction is gone.

CHAIRMAN DENARO: So you throwing out a little confusion here. When we are talking about deployment incentives, are we talking deployment incentives for V2V or V2X or are we talking about existing data or what?

MR. LEONARD: For the safety pilot, obviously we are storing the data because we are analysts.

MEMBER SCHROMSKY: Correct.

MR. LEONARD: But what you are saying and what Brian was also saying about
in TMCs, some of the TMCs that collect data, some of the states that collect data, do not store it. They don't retain it. It is there and gone. It is for instantaneous observation on video cameras but they don't store their data.

MEMBER McCORMICK: The problem with that is that they are not doing any metadata extraction. They are not capturing knowledge out of the data, about the data. They are just using it for instantaneous temporal services.

VICE CHAIRMAN KLEIN: This is for liability reasons. Paula was quite adamant about this. They do not hold the data. On the other hand, whoever plugs into the data, they can hold the data. They can archive it.

MR. LEONARD: So there is an issue. There are private data aggregators who collect, analyze, repack, and sell. And some states, I believe, do keep data.

So I think there is a larger
question here around data and who is going to keep it, who is going to hold on to it, and what they can do with it, whether you are going to be in private hands or public hands.

Who owns the data?

MEMBER WEBB: And we make choices. We say okay, let's take these three days and let's store that information for further evaluation. We normally do that once a month, once every two months or whatever, what we are looking to try and do with that information.

So it is very selective, otherwise, it just crams in totally.

VICE CHAIRMAN KLEIN: Okay, I am happy to say there is three cross marks at the bottom. So we are very close to the end.

A few incentives here. Tax incentives. So for investments in technology, for vehicle safety, there are some examples of this in Europe. I am not sure we have the capacity to influence the
tax code but maybe.

Prestige incentives. ITS is not the only one that does this but the innovator of the year, people who are really doing good work, they are rewarded. Others might want to be next year's innovator. There is some publicity that goes around it. It is affordable. Prestige sometimes doesn't carry a monetary price tag.

MEMBER McCORMICK: I would suggest making that innovators.

VICE CHAIRMAN KLEIN: Innovators?

Okay.

MEMBER McCORMICK: Yes, because you have got different aspects. It could be public entity. It could be private entity. It could be car maker, whatever.

VICE CHAIRMAN KLEIN: Okay, somebody came up with a very good idea but we weren't sure it was practicable. For ITS programs, there would be less federal paperwork. If we could implement this
recommendation, I think ITS would be fabulously successful if it was the one program that did not require any paperwork for its implementation, then it might lead to others. So it is a good idea let's see if we can make that happen.

And the very last thing is you know there is private sector area of our economy that is hugely tapped into, potentially hugely benefitting from ITS safety applications. That is the insurance industry. Is there any way since they are reaping significant private benefits to get them to contribute to the program? Do they support research? Do they publicize things?

MEMBER McCORMICK: I was asked to meet with the boards of both Allstate and Progressive at the end of last year because - - and their fundamental question was almost identical. And it was if we are going to get to a point where cars don't run off the road and crash into each other, it fundamentally
changes the business model of the insurer. So, I very well doubt that you will have any incentive on their part to donate money to accelerate the adoption of this program.

However having said that, the other comment that I want to make is that we have been doing, the VII consortium started in 2005, when we actually started getting funded. Industry on that program alone spent approximately $400 million, between that and IVVSS and CCAS. Not just in the in-kind but in the other expenses that went into doing it as well as all the deployment.

Industry as a whole is done with pilots. They are done contributing to this. They want to see implementation. Although that would be a good question as to where you get some contribution, I think we need to tap the people that haven't been participating yet, consumer electronic side, to all the places which still might have discretionary budget. But the industry players in this for
ten years are tapped out.

VICE CHAIRMAN KLEIN: Let me follow up with that point. Because I hear George and Scott saying there are really similar things. In both sectors it is like show me the stuff. I can implement today. Is that -- did I summarize you both that way? I think that is the really important message at the research level to hear that and to realize oh my God, implementation is a -- and remember you have got to -- a continued healthy future of research depends on today's implementations to start showing implementations today.

MEMBER McCORMICK: But I want to apologize. I don't mean to speak for Roger or for Ton, in case you guys did have a pile of money.

(Laughter.)

MEMBER McCORMICK: I mean I didn't want to say that you didn't have funding.
VICE CHAIRMAN KLEIN: That is the importance of implementation is one of the things. And I think as you go down to the county level, city level, AASHTO localities, that message probably comes really loud and clear.

Okay, it is 2:15. Okay so this will go into our larger wordsmithing machine.

Let me say just up here, I am somewhat -- is it the sense of the group that this could possibly not be included in the final report? I think people generally say yes, standard user interfaces are real. They are important but we are on top of that.

Does anybody disagree with that?
So it is Mom and apple pie. We are just going to strike it.

Okay, I suggest we -- well, why don't we do one more before the break?

CHAIRMAN DENARO: Well we have got two to go. What I recommend is let me go and do the Technical because I think that
might be pretty quick.

MEMBERMcCORMICK:Non-

CHAIRMANDENARO:Yes,exactly.

Best wishes.

And then I think we need to spend
a good amount of time on Security. So that
is what I am getting. So let's see if we can
get the technical thing done before break, go
on break, come back, and then get the
security one. Agreed?

VICE CHAIRMAN KLEIN:Okay.

(Pause.)

CHAIRMANDENARO:So these first
few recommendations, all have to do with
positioning accuracy. So I will just let you
read the preamble up there in the first
recommendation.

(Pause.)

MEMBERSCHROMSKY:These are
stand-alone GPS receivers you are referring
to, right?
CHAIRMAN DENARO: I'm sorry?

MEMBER SCHROMSKY: These are stand-alone GPS receivers, right? No carrier invention or anything like that. Correct?

MEMBER McCORMICK: Well there is always carrier intervention. You have to bring the signal in to the differential correction server to correct your local magnetic variances. And then that is pushed out over a network so that what is really --

MEMBER BERG: He's not talking about that, though.

MEMBER McCORMICK: Oh, sorry.

MEMBER BERG: He was but he wasn't.

MEMBER McCORMICK: Oh, that's right. I'm sorry. Sorry.

MEMBER BERG: That's all right.

(Pause.)

MEMBER McCORMICK: I like all this. The only problem is I think it is a little dense compared to all the other kinds
of recommendations that we have been looking at.

MEMBER STEENMAN: I was thinking the same.

CHAIRMAN DENARO: What do you mean by dense?

MEMBER MCCORMICK: There is a lot of words here.

MEMBER STEENMAN: An economy of words would improve it, I think.

CHAIRMAN DENARO: Okay. And you know we discussed this. There has been a fair amount of work done, particularly in CAMP. This is just a check on that. We are maybe not convinced that all the environments are there.

And it really comes down to a matter of the very last sentence there, understand the potential impact of the ignition on operation, including potential of misfiring and false alarms, which means -- and the probability of such conditions
occurring when vehicles are interacting.

It might be okay. It might be okay, this happens four percent of the time. You are likely to have a car there only three percent of the time. Just document that and let's all understand what that number is. That's all I am saying.

All right, so that is the first one. The others are related to the same preamble.

(Pause.)

CHAIRMAN DENARO: So the next one has to do with the cost of that implementation. So you can tell that you get carrier phase augmentation or assisted GPS or whatever. Well, I think I heard that the current GPS receivers on the safety pilot cost $100 a piece. That could be problematic.

MEMBER McCORMICK: Do you want the DOT to evaluate the cost of doing this?

CHAIRMAN DENARO: Yes.
MEMBER McCORMICK: Is that --

CHAIRMAN DENARO: We are close to being done.

MEMBER McCORMICK: Okay. Is that their role? I mean I am just asking questions. I am not familiar about them.

MEMBER BERG: They have to do a cost-benefit analysis in order to an NP.

MEMBER McCORMICK: Okay. Maybe would it be better worded to say do a cost-benefit analysis?

CHAIRMAN DENARO: Sure. And if this say is done by CAMP or some other organization, fine. We are saying JPO needs to monitor that. I think that is what he was talking about.

MEMBER McCORMICK: Okay.

CHAIRMAN DENARO: There is a threat to the system.

So the cost-benefit analysis, we can use those words. That's a good idea.

And the next one is this
preamble.

(Pause.)

MEMBER McCORMICK: Is that something we want the DOT to do or is that an automaker role? I am just asking the automakers.

MEMBER CAPP: You know when I read it it sounded like yes, this is an important design consideration as well to take one.

CHAIRMAN DENARO: The automakers would certainly do that, I would think.

MEMBER McCORMICK: I am just wondering what role the DOT has. When I read this, this reads like the thing the OEMs do to advance the viability of their package.

CHAIRMAN DENARO: Good point.

MEMBER McCORMICK: It's not clear what the DOT role is.

MEMBER WEBB: In your last statement about the others assume communications, although what specific
manufacturer did you have in mind?

CHAIRMAN DENARO: Google.

MEMBER WEBB: You define them as a manufacturer?

CHAIRMAN DENARO: I'm sorry?

MEMBER WEBB: We define them as a manufacturer?

CHAIRMAN DENARO: Who is arguably not a manufacturer.

MEMBER WEBB: That was the point I was trying to make.

CHAIRMAN DENARO: They are a software manufacturer. That is a good point.

MEMBER McCORMICK: Okay.

I mean I guess I view the world a little differently. They have something there, the car, the tier brings them something that says look, we have figured out how to diffuse this information. We now have a competitive advantage because we have some future. We know we can go put it in the room. We tested it to make it robust.
It is not clear that we are getting the DOT --

CHAIRMAN DENARO: So I think you are making a good point and I agree with that. But let me state it in a different way, which should be then restated here. And that is, that in their promotion of V2V and as they get into automation, these need to be looked at as integrative and complimentary and so forth, and not as independent initiatives. And so even though they are not doing the research on why they should be integrated together, we have done this and whatever else, that needs to be talked about because there is too many -- what I am reacting here is I am really getting tired of people coming to me and talking about how since you are going to have automation you don't need V2V or vice-versa because they don't understand the V2V --

MEMBER CAPP: Well, but that is just like people saying because you have
this, you are not going to need this sensor or that either.

CHAIRMAN DENARO: That, too. So we need a communication. We need to change or suggest changing the language from focusing on the JPO on this. But they are going to have to do wordsmithing.

What's that?

MEMBER CAPP: As long as they are not building cars, they are not going to --

CHAIRMAN DENARO: So why don't I suggest we change it to the communication part of that, as opposed to doing --

MEMBER McCORMICK: Well, I guess I still have a problem, though. I am trying to understand what is it that you want the DOT to do that is an appropriate DOT --

MEMBER CAPP: To be honest, I mean I run into the same thing all the time, Bob. That makes it interesting to talk about. Well, maybe we will use this sensor little bit more, this one a little bit less.
But I think it is a little bit premature to worry about what role exactly the different sensors are going to play in some futuristic car. Because there will probably be some new sensor technology to replace all this stuff by the time we have driverless cars.

Yes, my guess is every sensor we are talking about today will probably be obsolete by the time we have a truly driverless car.

CHAIRMAN DENARO: Good point.

MEMBER SCHROMSKY: Bob, just a practical question. So I am keeping it to this analogy of the black box. So in DSRC mode, are you looking -- we mentioned additional GPS were mentioned at $100 a pop. Is there a way to hook into, say for instance at Ford or GM, they have a GPS receiver for their onboard navigation system.

MEMBER BERG: That GPS receiver is not going to work.

MEMBER SCHROMSKY: Is not going
to work. They need something to supplement it. Okay.

MEMBER BERG: On purpose. I mean it doesn't need to be.

MEMBER SCHROMSKY: Or could you use that in conjunction with the other one to possibly narrow that --

CHAIRMAN DENARO: Well, this is getting into an argument. How many times are you going to have to sit down and talk about a car?

I mean I think eventually those will converge and you will have a sensor in there that can handle all needs.

So, --

MEMBER CAPP: The observations are the concerns these things have been on a rack that will be engineered to be failsafe and all these types of things to save lives. I don't know what we need to ask Ken to do here.

CHAIRMAN DENARO: Well, I would
like to see the JPO have some clear messaging on how this relates together. So provide the leadership on this.

You might argue well we don't need them to say that. I would disagree with that. I think we should Buzz Card here and it would be a good place to start.

Now, I will go back into some history where I know people from the JPO explicitly said this will get rid of all centers on cars because it is much cheaper.

MEMBER CAPP: That was a pervasive view of a lot of folks, six, seven, eight years ago. That is kind of my point is that whole thing evolves, how do we really make automated, we didn't use the word automated five years ago either. Autonomous cars, we are learning a lot.

The ISO 2682 fail-safe stuff, that didn't exist seven, eight years ago, too. So we are really evolving our thinking on what is it going to take and it is going
to continue to evolve.

You may rely on this sensor a little more, this sensor a little less. And that will probably change over time, too.

CHAIRMAN DENARO: Yes, true.

Yes, sure.

MEMBER SCHROMSKY: Bob, you live in Chicago, right? So you know trying to get GPS signal in Chicago, and then you have multiple layers. I mean, I like your point address the urban. If I can't get GPS signal, what other GPS broadcast in the tunnel, right? I mean that is an area that nerving center to be looking at the demographic shift, we are starting to see more people move into urban centers and all the issues we have.

This goes in another one, right, getting GPS signals in San Francisco are very challenging. So it is not just the trees. But what other technologies can be used to enhance that? I am curious.
CHAIRMAN DENARO: That is not in here but that could be another recommendation, potentially, is to work the problem of urban positioning.

MEMBER BERG: If the DOT says we need a solution for Manhattan, somebody will figure something out. If they are incentivized by money or contests or whatever else you have up there.

The private sector will figure out a solution.

MEMBER McCORMICK: I agree. It is a good observation but I don't think there is any role for DOT at this time in that.

CHAIRMAN DENARO: Okay?

(Pause.)

MEMBER SCHROMSKY: So Bob, I like this. I think one of the things we realize when we are talking about it in our subcommittee is who is the governance body for this. You know rules shut that device off.
Granted there is a center but is that a private-public partnership? Is that the state? Is that the county? Is that DOT?

MEMBER McCORMICK: It was a long path to get to the last sentence here. But what I am reading here that I like is that take out the first phrase. Identify the technical and policy actions that need to be taken to user trust level at a trust level that supports the cost-benefit ratios calculated for deployment is a thing that they need to do. The justification all above it is kind of overwhelming. But if I just take out the ones that text and are misbehaving, even if it is not misbehaving, they ought to identify the technical and policy actions that should be taken to keep the user trust at a level that supports the benefit-cost ratios calculated by deployment.

That is something that they should be doing, regardless of whether it is a detection of a misbehaving device or an absence to the
device or a failure of the device. I think that is a valid thing for them to do.

I think we could shorten the whole top stuff by saying devices can misbehave. It can be malicious. It can just be bad code. It could be bad weather. It could be who knows what it is. But trusting in these devices to work is of paramount importance and that we ought to figure out --

MEMBER BERG: Scott, you have to give a reason why you want to do that. Just saying do this, I mean, I wouldn't survive very long in my company if that is all I did.

MEMBER McCORMICK: Well rephrase the top part and say devices can be misbehaved, it can be malicious, it can have failures, that they can have all these other things happen; therefore, we ought to identify what the actions that we should take to keep the trust level up that supports cost-benefit.

I don't care if you want to
delete it or not. I'm just trying to fix it.

MEMBER HOLTZMAN: I think we ought to leave it in. It makes a lot of sense to leave it in. It begs the question if you take it out and wonder why isn't it there.

MEMBER McCORMICK: Okay.

CHAIRMAN DENARO: Okay. The preamble stuff needs to be something taken out. Okay.

Are you happy Roger?

MEMBER BERG: I'm always happy.

(Laughter.)

CHAIRMAN DENARO: It's three o'clock on the last day. Okay, we are done. We will do this. You will see a final form that is way scaled down.

MEMBER WEBB: You have rations instead of ratios.

CHAIRMAN DENARO: Okay. So, we are on the break, I guess.

VICE CHAIRMAN KLEIN: Reconvene
at three?

CHAIRMAN DENARO: How about 15 minutes? How about five after?

(Whereupon, the proceeding went off the record at 2:39 p.m. and went back on the record at 2:57 p.m.)

CHAIRMAN DENARO: All right, we are going to get started.

And just as a time watch, we do want to end on time at 4:00. So we will do that. So I have asked Scott that wherever we are at ten of 4:00, we will shut off this discussion and do some wrap-up and next steps and things like that for the last ten minutes. But we should be able to get through it that way.

So if we have to defer any discussion because we get wrapped around the axle, Scott will manage that.

MEMBER McCORMICK: Over the course of the last of the four meetings that we have had, the Security Subcommittee has
reviewed a number of different documents, including Scott Andrews' presentations, Dr. William Whyte's presentation on why the system was constructed the way it was. There was some additional research done. And to the subcommittee, I have provided them with the other research but we did have a larger body of work that was done. It was presented in a longer presentation which I will mail to Bob for distribution. And I am ignoring all the boilerplate in front of this because it is similar to what everyone -- it is identical to Bob's, if you will. And what the subcommittee consents on saying to this group is embodied in this document.

In order to give a framework for this document, the Security Subcommittee and, if agreed to, the ITS PAC as a whole has reviewed independent research on a proposed security implementation for DSRC and have been made aware of several potential vulnerabilities in the security of the DSRC
protocol. And at the meeting this morning, we had William Whyte participating in the discussion. At 1:00 he had a lengthy discussion with one of the researchers and provided me with an additional piece of information. But he completely concurs with all of the information presented in here.

It is understood that the security protocols and algorithms will evolve over time to meet changes in the requirements for security. The current message validation protocol will be challenging to deploy broadly securely due to the lack of a support mechanism to allow root authorities to change keys used in the public key infrastructure construct, as well as for the certificate authority to change signature algorithms.

Developing a solution to this finding should be of high priority, due to an impact on scale. Now, CAMP is aware of this and they concur that it needs to be a high
priority.

The second bullet was that the vehicle to vehicle implementation has a high dependency on the time and location stamp. When they are communicating, you tell the time that you are communicating and physical GPS location of where you are communicating, so you know that a near proximity device at the same time that you are there.

That stamp, however, that time and location stamp, can be forged in a manner that would allow for wormhole attacks. Some mechanism to assure time and location were produced according to the specification needs to be considered.

MEMBER BERG: So can you say what this means in normal people's lingo?

MEMBER McCORMICK: Okay. Let me --

MEMBER BERG: What is the accessibility?

MEMBER McCORMICK: That is an
excellent question. Let me open up that document.

MEMBER BERG: Because I have a hard time following what it means.

MEMBER McCORMICK: Okay.

MEMBER BERG: Maybe I'm not a normal person.

MEMBER McCORMICK: No, no, I agree. It is a complex issue. It took us a while to get our heads around it.

MEMBER BERG: But like ten words?

MEMBER McCORMICK: Yes, that is what I have. Probably the best way to do that --

MEMBER SCHROMSKY: Well to sum it up, I would say one of the things is it's trust in there. So how do I trust and verify the end user? And there are ways to possibly skirt that. Which one would be a wormhole. The other thing -- so one of those would be attacked.

The other one that, and Bob you
talked about this earlier, was when you came in. That mechanism/certificate authority, at that point, who is governing that?

MEMBER BERG: Root keys and certificate chains and all that -- 99.9 percent of the people --

MEMBER McCORMICK: Let me back up just a little. In the construct that we currently have, there is no format to support paving a root key, a root key in your vehicle. There is no format mechanism where you do that.

Every DSR device must change their root key simultaneously. They have to do that in a simultaneous manner.

All messages with certificate chains, because each one is going to have a certificate and those are going to be chained together, that are rooted in this new root key, they will look like forgeries to the vehicles rooted with the old key.

So it is kind of like I have got
an ID and my ID -- all of sudden everybody changes ID and you have got the old ID, you are no longer valid. So you will look like a forgery.

VICE CHAIRMAN KLEIN: Can I ask? This strikes me as a problem that would emerge in the process of developing the protocol or our standard. Has the standard been finalized and is this being discovered after the finalization?

MEMBER McCORMICK: In discussion with William Whyte, part of what was discovered was aware to them but they hadn't started working on it. One item of the three was new. And so that is what he is in the process right now of working with, they are reporting this information in 1609. It is just -- we will have to clean it up because it is more technical but we will do that.

We will clean that up so it is more digestible, so that my mother understand what I am saying. We will do that.
But for the purposes of this meeting, I didn't really have the time to do that other than extract from the document.

VICE CHAIRMAN KLEIN: Well and I have a sort of process question. You know discover a problem in a standard. That is fine. But in what kind of process has this discovery been made?

MEMBER McCORMICK: It is not a discovery of the standard. It is the discovery in terms of the architecture. There is an architecture to this design and not all of the elements of that architecture have been completed. And what they are doing is they are saying that they discovered some potential vulnerabilities, a couple of which they were sort of aware of, one of which they were not.

And so the recommendation has nothing to do with how you solve that. It is what a recommended process is for the JPO going forward.
MEMBER BERG: Okay. So then what you just read and what you explained up here is not really that relevant to the people interpreting the suggestion. Do they have to know all this, root key and certificate chains and wormholes?

MEMBER McCORMICK: No, I need to simplify that --

MEMBER BERG: Okay.

MEMBER McCORMICK: -- and just say there are some vulnerabilities that are discoverable. I will probably have more --

MEMBER SCHROMSKY: I think that is a valid point. I think in laymen's terms, two vehicles, you and I. I have to verify that you are -- you know some of the antivirus. So the big point is whatever is designed from the deployment or architecture, it has to be flexible. So if something changes, technology, that I can push down and you patch to your vehicles so we are in --

MEMBER BERG: So that is what we
should say.

MEMBER McCORMICK: Yes, okay. I don't disagree with that. We were mired in trying to just take the algorithms you gave us and condense them into words first.

MEMBER KISSINGER: Well what are we asking them to do?

MEMBER SCHROMSKY: Well I think the big issue that we found out is who is going to manage and verify the credibility every black box is in a vehicle. Because you have to have that mutual authentication between the two to know if it is going to be valid. Because the threat is, if I spoof it, am I adversely doing something? And then it has to be smart enough that to take it one step further, who does that?

One of the things we have thought about was as soon as I turn on the car, the car will actually authenticate on both the network and verify you are on the way and you are valid and the end user doesn't have to do
anything. And how do you do that? And who does that?

MEMBER McCormick: It largely revolves around the problem of an identity misbinder. If I call you and your phone rings and it thinks that it is coming from a phone, okay, but it may not be. Through a variety of mechanisms, it may not be. And so that is a loophole in the system. And through that identity misbinding loophole, it is possible to breed a wormhole attack.

CHAIRMAN Denaro: I mean the JPO didn't design all this stuff.

MEMBER McCormick: Correct.

CHAIRMAN Denaro: They hired really capable contractors.

MEMBER McCormick: And one of the people they hired to do it was --

CHAIRMAN Denaro: You are saying these companies missed this. The design was --

MEMBER McCormick: Well we asked
William about that. And William emailed me back and said that if this doesn't work, it is the certificate's DSMs. He said however, it would work against it. But that wasn't deliberate on our part that it doesn't work against it. It was accidental that the basic safety message said it is not vulnerable to this.

He said however, that doesn't apply to other types of certifications. And so the JPO needs to make sure the standards include appropriate countermeasures or require -- not include but require appropriate countermeasures. And he is now bringing that to CAMP and to JPO to address.

CHAIRMAN DENARO: All right.

MEMBER McCORMICK: And you are right. I will bunny rabbit simple this down much more.

CHAIRMAN DENARO: Well, so let me address that for a minute. I think there is a fine line there. If you get too narrow and
specific, then that could be a problem understanding and so forth. If you are going to make it too general saying, gee, there might be vulnerabilities, please look into this --

MEMBER McCORMICK: We are not asking him to look into the vulnerabilities. We have already made the people working on it aware of the vulnerabilities. That is not the recommendation.

CHAIRMAN DENARO: So what is the recommendation?

MEMBER McCORMICK: While the committee is not qualified to assess the severity or validity of the research, we feel it is important for the JPO to similarly be made of this and other research.

In addition, the Committee is recommending that the JPOs continue to seek out and consider external research in the security aspects of DSRC communications as the technology environment evolves.
CHAIRMAN DENARO: Okay.

MEMBER MCCORMICK: Roger and I had a brief email earlier that said well yes, they could have bid to participate in the program. But if you don't win the bid, you are not in the program. That doesn't mean you haven't done valid work in the space.

So the question was really is that is there a vehicle, is there an active effort on the part of the JPO to find, harvest, and review this information. And is there a vehicle by which researchers in this space, as we evolve, as we evolve communication protocols, as we evolve hardware and technology, is there a means for them to contribute, a methodology by which they can say okay, I have done work in this space. I happen to know you guys are doing it. Here is an email address I can send it to at security dot whatever that is.

CHAIRMAN DENARO: Does there need to be some kind of consortium or something?
Is that where you are going?

MEMBER McCormick: I don't think so. There is too many people working in too many different areas that are now being affected in this space. Okay? There are people that are now looking at DSRC, everything from people that are looking to block the signal to people that are -- in most of the automated vehicle being done, they are very concerned about the ability of DSRC because in their architects, they believe that it has huge value going forward with automated vehicles. So they all want it to work but they are not working with the automakers right now and they are not working with the government. But they are just doing their own research and their own product development.

And the point was is that there ought to be a mechanism by which they could feed that information to the JPO, for which they can disseminate as they see fit.
CHAIRMAN DENARO: Are recommending a mechanism?

MEMBER McCORMICK: Well, and we talked about --

MEMBER BERG: DOT is supposed to do business development, which is what it sounds like.

MR. CRONIN: So just stepping it back a level, I have tried to think of -- when we started this assessment, I think, and I might recall incorrectly, was that there was some concern that we were creating an ineffective security solution that was never done, too costly. We weren't on the right track at all.

And so if I am hearing this -- either I am hearing in that first sentence is you guys have no idea but the one you are doing has some issues. Or I am hearing, it is fine but there are some issues. I'm not sure.

So either/or I have a
misconception of what you were starting to do when you started this subcommittee. But I just recall that we have a lot of -- there has been over the past a lot of pressure on is the security solution, because it is large and never really been done before, the right one.

So can you respond to that?

MEMBER McCORMICK: Yes. First I want to answer that question. These people aren't looking to sell anything. The only person looking to sell anything is actually the people working on the program now. They are vested in the solution. This is a question where somebody said I have developed an architecture. I have developed a protocol. Others independently went out and looked at it and said wait a minute, we found some vulnerabilities. Who do we tell?

MEMBER BERG: IEEE. We talked about standards this morning for an hour.

MEMBER McCORMICK: Okay. So our
recommendation --

MEMBER SCHROMSKY: So at the lower level, there are some vulnerabilities. And above that, assuming you fix that so the communication is secure between the two, what I think we have always talked about and what I have seen DOT brief in earlier meetings is how do I make sure and connect and verify that that box in that vehicle is a valid user. And if something changes, I am able to change that black box in that car/automobile and make sure it is valid and is a valid note on my network. Right? Who does that? Who pays for that?

So the security has some vulnerabilities but I think what security needs is more implementation and saying okay, as soon as we fix the security problem, we have a way of doing it. The practical would be --

CHAIRMAN DENARO: I think that is a good issue but it sounds like a different
issue than we what we were talking about.

MEMBER SCHROMSKY: Can I ask for

another comment here?

MR. BROWN: I will try to speak

for Paula. They go from business perspective

is not to -- this is not a business

opportunity. We have expertise in this

space. WE have developed a lot of protocols

in Wi-Fi, in data transfer. We are trying to

make sure we have an avenue to help provide

that and make sure this is the best protocol

data. We are not trying to change anything

except make this more secure so when you do

implement it, it is something that can be

counted on much more.

So the summary of what we were

trying to put in there was how do we make

sure you can get that independent insight

into this without having to go through 45

different places?

VICE CHAIRMAN KLEIN: And this

was developed in the context of the IEEE?
MR. BROWN: Yes.

VICE CHAIRMAN KLEIN: So isn't the answer you call up the IEEE? Isn't that if there is a problem protocol development in the IEEE process you go to the IEEE to report the process?

MEMBER BERG: Yes, why not?

VICE CHAIRMAN KLEIN: Not just why not. That is why the IEEE exists.

MS. DICKMAN: I think the point here is as Ryan said, the Intel's interest here is that DSRC is successful. We have folks in the original product. We have folks in the lab. This is what they do. They research security type issues like this. They come up with some research that they believe is very relevant to successful deployment of DSRC. And this group is -- I mean DSRC is one of these groups we have been talking about for the last two days.

It seems relevant that this group end, you know, the JPO and RITA would want
this information. We can submit it through the IEEE process. However, that is not quickest route. You all kind of want a faster route to the DSRC, right?

VICE CHAIRMAN KLEIN: Well is a process.

MS. DICKMAN: I think it is something that this group, and we don't want to put our horse blinders on and say everything is completely secure when there is issues that have been identified. If folks come back and say they take this sort of their technical experts and say you know what, we looked in this non-technical expert security. That is okay, too. All that we are saying is we believe that DOT should be aware of this and folks in this room should be aware of this so that we are all kind of -

MEMBER McCORMICK: And if I can refer to William Whyte's letter to me that I sent all the material to him to review
because I am not qualified to judge the veracity or validity of it.

His comment back to me says it is good to see this level of review by a world class researcher. Deploying this will be the biggest security system in history. So the more scrutiny it gets, the better. We would love for this review to be provided directly to 1609 and to industry bodies such as CAMP that are developing specifications, as well as to the U.S. DOT.

Now this is from the senior security researcher.

MEMBER BERG: So what is the recommendation from this committee?

VICE CHAIRMAN KLEIN: Your recommendation is a process -- you have a process question. In a case like this, what is the process to cope with it? And there is two things. There is the official process which there is no question about. There is an IEEE protocol and there is a phone number...
to call and you can consult the manual. There is a process manual how to deal with this.

In addition, sure, you might want to call directly to Ken, whose cell phone number you got and say hey, do you realize that seven levels down there is a hot potato? But in terms of the official process, it is established. That problem has been dealt with.

MEMBER BERG: So what is our advice to that?

MEMBER McCORMICK: So what is the process to deliver it to the U.S. DOT CAMP?

VICE CHAIRMAN KLEIN: The DOT and CAMP are present in the IEEE.

MR. SILL: Can I respond to that?

VICE CHAIRMAN KLEIN: Yes, please.

MR. SILL: Okay. The general answer to get input into the standards process is to participate actively in the
working group. So those working groups are completely open to the public and any interested stakeholders at no cost.

That said, Dr. Whyte is actually under contract to U.S. DOT and is working in this arena.

Further, there remain portions of the security solution which U.S. DOT has not yet finalized, nor have they publicly released. And it is possible -- how do I put this? There remains a substantial likelihood that that solution, that intended security solution which has not yet been publicly released, actually addresses these identifiable vulnerabilities. But until our folks are ready to publish that information, there is not really much more there to offer.

MEMBER McCormick: Well Dr. Whyte is aware of this and said and they weren't addressed.

MR. Sill: Okay but he is working on a substantial part of the solution and not
the whole solution.

MEMBER McCORMICK: Correct.

MR. SILL: I guess I am having a hard time understanding how something like this is the kind of thing you would put into a recommendation to the Secretary. A) Letting us know, which I think you have. And you certainly if you forward on to U.S. DOT, we will act on it and otherwise, making the Standards Working Group aware.

Does Dr. Whyte say anywhere in his response that he will raise this with the 1609 Working Group at their next meeting?

MEMBER McCORMICK: He was having a conversation with Jesse Walker, Dr. Walker, at 1:00 today to get more information.

MR. SILL: Okay.

MEMBER McCORMICK: I don't what he has decided yet. It is not the discovery that was the recommendation. The concern was a little bit larger. It was is there a vehicle -- you know people participate in
standards organizations for a business reason. Okay? There is no one there that is altruistically participating in a standards organization. They all have a reason for being there.

And the issue is that okay, if somebody has knowledge that they discover -- and that doesn't necessarily have to be in this aspect. It can be in any aspect of the connected vehicle ecosystem. They discover it. They come back is there somebody that I should share this with. Is there a method to do that? The answer that says yes, go joint 1609 is not the solution everyone has.

So the question is, is there a mechanism. Do we just say yes, send it to you?

MR. SILL: Well I tell you if you were to send it me, I would see to it that it got to the 1609 Working Group. But that said, we are not staffed to be the clearinghouse where everybody thought is --
MEMBER McCORMICK: I understand.

MEMBER KISSINGER: It sounds to me that you are -- I mean one solution is you can ask JPO to do an independent technical review of that, whatever that is, or a peer review of a final report.

MEMBER McCORMICK: We are not asking that.

MEMBER KISSINGER: Well if you are not asking that, I don't know what you are asking.

MEMBER McCORMICK: Well my problem is that --

MEMBER KISSINGER: I mean I am essentially really sitting here saying is you guys have somebody under contract. I mean, obviously they are going to notify DOT of what they found. You have got them on contract. So I don't think that we need to make a recommendation because there is a researcher to notify DOT.

MR. SILL: We observe and
participate in the Key Standards Working Groups almost without exception in every meeting and we certainly follow the process. And 1609 is one of the three key standards.

So I can't picture William sweeping this under the rug. So we will be well aware of it no later than an upcoming meeting that is two weeks from Tuesday.

MEMBER McCormick: Let me take it to a higher level because I believe what it is is it is a communication issue. And I know the communication group has talked about this communication.

But for years people have approached me specifically to say tell me what is going on in the program. When they put out this program under Brubaker doing something with mobile phones, I was inundated with emails and calls by people going oh, are they abandoning DSRC. So I had an after-hours meeting with Peter Appel. We sat down and we said your communications are horrible.
Why are people asking me? I shouldn't be explaining this. That explanation should be out there.

People call up and said how do I get information on this. And I get inundated with people when something new comes out like this RFI I just showed you. That is one thing. I know how to respond to that. And the government has gotten better at it. But there isn't an obvious portal.

Now that we have got many, many more industries involved that aren't involved in automotive but are involved in mobile or involved in apps development, involved in whatever. Yes, you can go to the RITA site and there is tons of information there.

The question is, the question that was raised, and it was actually Bob that brought it up the other day, that says what is going to be the function of your recommendation. I said well my recommendation was to say that I think the
JPO ought to be aware of this and other research. And Bob said well, maybe you ought to have a forum or meeting. And I said hold on, I am not telling them what they ought to do. I said the general thing was that if you are not aware of it, this working being done, there is a way that you can create a mechanism to harvest it or provide some email gateway for somebody to send it to you.

CHAIRMAN DENARO: So let's walk through this.

MEMBER McCORMICK: And if we don't want to do that, I am perfectly fine with that.

CHAIRMAN DENARO: Let's walk this through one more chess move. Okay?

So if we did a recommendation of saying that the committee is aware of certain vulnerabilities that have been separately communication through the organizations and so forth. We recognize this as a significant risk that is not resolved. So we just want
assurance or we want to urge the JPO to
monitor this situation, make sure it is
fixed. And then their response is, this
information you have got in IEEE, it is
being handled there. We are working on the
problem. We are well aware of it and so
forth.

In a sense we don't care -- that
is the wrong word but it is not our
responsibility to worry whether it is fixed.
We just want to make sure they are working
on the problem. Then they are doing what
they should.

MR. SILL: Bob, realistically, by
the time your report --

(Laughter.)

CHAIRMAN DENARO: Good point.

MR. SILL: I should be
extraordinarily surprised if this issue has
not been resolved.

CHAIRMAN DENARO: Good point.

But we have to act on what is here.
MEMBER McCORMICK: And I'm okay with it. But hearing that, it is like okay, we have done the job, which was to make them aware and got the right party involved. Okay. You don't have to worry about a recommendation.

CHAIRMAN DENARO: And by the way, and Ken has pointed this out before, our formal memo is not the only contribution we make to the JPO.

MEMBER McCORMICK: Right.

CHAIRMAN DENARO: They are sitting here right now listening to this. You know, I think it is almost mission accomplished on this issue by having this discussion.

MR. SILL: I mean at the extreme, if you go to the standards page, there is probably an email address, it is either Ken's or mine. And if you send something, it is not going to be ignored.

MR. LEONARD: And that was one of the things I wanted to point out. We went to
your website. You have contact us
information. There are phone numbers. There
are staff rosters. There is an email address
that is monitored.

You know I hate to get the
declaration of war through that email
address.

(Laughter.)

MR. LEONARD: There are numerous
ways to communicate information. And for an
office like ours, it is challenging.

You could communicate this to me
and that might not always be the best
mechanism. A better mechanism would be
contacting Steve and contacting Brian, having
William Whyte who works with Steve and who I
have had some discussions. I said hey this
is a serious issue. I would like to get on
the Joint Program Office calendar to brief
what I think is a serious issue. It might
take two months to get on the calendar and
have that briefing. But I mean these things
do.

    We have multiple processes. We are simultaneously working hundreds of technical issues across the Program Office at any given moment in time.

    You know that said, if there is a declaration of war or some critical piece of information, call in.

    MEMBER SCHROMSKY: So to your point, what is the recommendation. I think one of the things that I harp on is let's assume the standards are laws. The law has been written. Who is enforcing the law? There is not -- correct me if I am wrong. JPO and DOT, assuming we established a protocol because DRC is a communications protocol. So that has been established and we are able to securely from one vehicle to another pass information. That has been established.

    If I read the nice binders that have been presented to me over the last 18
months, would I still see and identify which I think is a recommendation that we haven't documented but I don't think it is just security is assuming this has all been established, if I go rogue, whatever it may be, if I don't call myself out, somebody else has to call me. I'm a bad seed. Who is going to do that? And how are they going to do that? I still don't see that happening.

Nobody is doing it today. Somebody has to do that. If it is a private, public, but somebody has to do that. Securely manage that. So put it that way.

CHAIRMAN DENARO: And thanks for that, Brian. I was actually going to bring that up because we didn't address that explicitly. We have discussed it in the past. It is one of the things sitting out there is this whole -- in fact, it was an explicit request from JPO and the legislation saying when is the proper role for public and private. And in this particular, that back
end thing is all laying out there.

I would like to see us having a recommendation on that. We might be right and we might be wrong. But I still think we should have an opinion. So I think we should do that.

But before we go to that part, and I will repeat I do agree with you, how do we want to handle this recommendation on this thing? Do we want to drop it? Do you want to make it something simpler?

MEMBER McCORMICK: Well I think we can drop it because the committee member who brought this up said I think this is an important topic, brought it to the subcommittee. We reviewed the research. I have had it vetted with multiple places because I didn't know the validity of it any more than you did. And they all said yes, one of them is new.

The question is, is that presented in a recommendation or have we just...
now presented it, along with William, presented it to the right people?

CHAIRMAN DENARO: Or since they saw the --

MEMBER McCORMICK: And I am saying it has been presented to the right people.

CHAIRMAN DENARO: It is a finding, not a recommendation.

MEMBER McCORMICK: The problem I have with what you are just talking about with that other element that is out there, that is known to everybody and it is impossible to implement without resolving it. So it is almost redundant for us to make a comment on it.

MR. SILL: Let me just make, hopefully what may be a last thought on the standards issue.

Especially the security standards but none of the standards will ever be "done." They will be, at some point,
sufficient mature --

CHAIRMAN DENARO: Sure. That's a good point.

MR. SILL: -- in that initial deployment and those who wish to create trouble will eventually find ways to break into that security system.

CHAIRMAN DENARO: Good point.

MR. SILL: And there will be updates and this will go on in time.

This particular vulnerability that you identified will be dealt with as best we can, and hopefully it will be resolved. But there will be more in the future and will find out about them by various different means. And without exception we will act promptly to resolve them. And I'm not sure what else we can offer there. That is kind of how it works.

MEMBER SCHROMSKY: I agree with it. I think part of the recommendation is buried in their root certificate or
mechanism. When that does happen, how do I enforce that?

So today if there is a vulnerability on this, who will push out the patch to address that? Somebody will find a way to get into it. How do I securely do that?

MR. SILL: And that is part of the greater architecture for the entire security system that includes standards. And there are pieces of that have not been publicly released. There are also pieces of that had not yet been fully processed. We haven't made recommendations yet. But I am going to look toward Brian because he knows more about what is happening there.

CHAIRMAN DENARO: Okay, I want to come back to that.

MEMBER SCHROMSKY: I will offer a bureaucrat's answer. A big chunk of that is not my job.

(Laughter.)
MR. SILL: You will figure that out. I will keep harping on this. It is a big hole that I just keep seeing. But nobody does this today.

MR. LEONARD: And I think what you are talking about is what we call the SCMS, the Security Certificate Management System. So nobody does that today. We have had discussions with the OEMs and with others ways that that could be done, whether it could be done by government, whether it could be done by the private sector.

MEMBER SCHROMSKY: And who pays for it?

MR. LEONARD: And so those things I think we have to stay tuned and see where the NHTSA announcement -- what is identified in the NHTSA announcement. People have been talking about this issue for some time. So, I am confident that it will be addressed.

Now, when NHTSA makes its announcement, it may not be addressed to
everyone's satisfaction. And that is why it is a process that people get to comment on. So that is another piece of this.

And Scott, it also answers your question. You have communicated to the Joint Program Office and we have consultants who we are talking to the same consultants. We have them under contract. When we are going through a rulemaking process, if we are going to a rulemaking process and there is a description around this in the rulemaking process and it is not addressed, there is an opportunity there to comment on this and also on the issue you raised. Is the Security Certificate Management robust enough to address the concerns that you were expressing now?

I would say it is appropriate to express them now. It would be inappropriate for us to offer an answer.

CHAIRMAN DENARO: Yes, that's fair.
So let me just try to get some closure on this. I think there is two issues on the table. One is pointing out some vulnerabilities that need some solution. The other is then the operation, ownership and authority of whoever is handling that. So let me separate those two.

I see us steering toward not making any recommendation with regard to the possible security vulnerability.

MEMBER McCORMICK: Right. We have made the correct parties aware of that.

CHAIRMAN DENARO: Not making any recommendation at all. Being silent on the potential vulnerability that has been uncovered in this analysis.

MEMBER BERG: Not really. I would advocate recommending an methodology for addressing future vulnerabilities. Because we know they are going to be there.

This one happens to be here today. I agree with Steve. It will be taken
care of by the time it is deployed. However, a month later, there is going to be another one.

CHAIRMAN DENARO: But does that recommendation have to do with -- is that back to the structure?

MEMBER BERG: I don't care. What we should say is make sure you are resilient enough.

MR. SILL: Roger, are you referring now to the research process --

MEMBER BERG: Right.

MR. SILL: -- and making sure we get the vulnerabilities identified during the research process? Or are you now talking about make sure when you guys deploy this thing, you have the means in place to assure that you stay only one-half step behind the troublemakers.

MEMBER BERG: Exactly.

MR. SILL: That is not the same thing as having you manage it during the
research process.

MEMBER BERG: Correct.

CHAIRMAN DENARO: Is that what you meant, Roger?

MEMBER BERG: Most certainly.

CHAIRMAN DENARO: Okay.

MEMBER McCORMICK: Well why not both?

MR. SILL: Well I think you need both to put the answers in there.

MEMBER McCORMICK: Well I understand that. It is just well why not both as the recommendation.

CHAIRMAN DENARO: So Brian, are you comfortable with not addressing this vulnerability question as a recommendation?

MEMBER SCHROMSKY: I'm okay.

CHAIRMAN DENARO: Okay. Is there anybody else here who is uncomfortable with that or are we okay with not addressing that vulnerability issue that we talked about here?
VICE CHAIRMAN KLEIN: I will make one related comment.

CHAIRMAN DENARO: Okay.

VICE CHAIRMAN KLEIN: Groups that point out vulnerabilities should be enthusiastically thanked for doing it. That is kind of a culture issue.

CHAIRMAN DENARO: Okay.

VICE CHAIRMAN KLEIN: So this originated with Intel. Is that right? So many thanks to Intel for pointing this out.

CHAIRMAN DENARO: Absolutely.

VICE CHAIRMAN KLEIN: Absolutely. They made a very, very big contribution.

MR. LEONARD: The nature of the zero vulnerabilities issue is you do not know about them and you know about them.

CHAIRMAN DENARO: Good point.

MR. LEONARD: And that they have to be dealt with quickly. Yes, and we are grateful that people identify them beneficially, rather than exploit them.
maliciously.

CHAIRMAN DENARO: You make a good point.

MEMBER BERG: So we are getting to our ten-minute window. Can wordsmith that statement so we are done with it?

CHAIRMAN DENARO: Well I think we go to Brian's comment.

MEMBER McCORMICK: Oh, sorry.

CHAIRMAN DENARO: Right? Oh, did you say you wanted to put a thank you note in there?

MEMBER McCORMICK: No, no. To Roger's point and Ken's point, they just said are you talking about this or are you talking about that.

CHAIRMAN DENARO: Yes.

MEMBER McCORMICK: What I wanted is to make sure we tap to that so that we can --

CHAIRMAN DENARO: Okay. But I think we are onto Brian's comment about the
authority. This is a whole public-private and whatever.

And I will preface my remarks by saying that I don't believe I have enough information. There is a lot of smart people who have been working this for a long time and if it isn't obvious already, then it must be harder than I think.

But my opinion with what I do know sounds like it should be a private organization that does that. And you need to find the incentive so that this private organization can make money at doing that kind of thing. I mean that is kind of a simple statement.

MEMBER SCHROMSKY: I guess one of the question I have, I mean that was briefed JPO I think in the first meeting, that same certificate authority. So is the recommendation we agree with your initial using us as a sounding board, if you will, to reconfirm that your initial findings? We
also agree --

CHAIRMAN DENARO: Agree with what?

MEMBER SCHROMSKY: -- agree with your hey there has to be this authority and what it looks like.

CHAIRMAN DENARO: Well, do we have a recommendation of what it looks like? Do we want to weigh in on a private versus public?

MEMBER KISSINGER: Isn't that something extended from the rulemaking process?

MEMBER McCORMICK: You know we can recommend it be a public-private nonprofit. I think you are right. It is going to be resolved in the rulemaking.

CHAIRMAN DENARO: Do we know that?

VICE CHAIRMAN KLEIN: Well, I think it is too late at this point to formulate a recommendation. That is pretty
ambitious for the last five or ten minutes.

MEMBER SCHROMSKY: No but I think
for the final measure and not for this
discussion. But I think it is something that
is warranted that it will be a takeaway that
if we are going to do a recommendation what
it would look like.

CHAIRMAN DENARO: All right.

MEMBER SCHROMSKY: I think we
have time for the final memo to put something
like that in.

CHAIRMAN DENARO: Well and so I
was just going to go there. As much as I am
trying to get things done here in this two
days with respect to this memo, if there is
something that we need to deliberate a little
bit more on after making some phone calls and
all kinds of things, this is one item where I
think it is worth a little more discussion if
we can come up with a recommendation that is
good. If we can't, then so be it.

I mean it is not our job -- we
can't hope to be comprehensive across all possible things that need to be done. We can only get done what we happen to find and go. You know if we miss a whole bunch of things, we don't get graded on that. We need to do the best job we can but we are not going to think of everything.

MEMBER SCHROMSKY: No, I agree. But I think it comes down to if you agree with DSRC's communications, assuming you have the spectrum, assuming you can build boxes, whatever it may be, I think that is the low-hanging fruit.

CHAIRMAN DENARO: Yes.

MEMBER SCHROMSKY: I think the elephant in the room is all right, who is going to manage this. Who is going to be the authority to make sure these are valid? Is that the only --

CHAIRMAN DENARO: So if we can come up with a recommendation on that, and frankly I don't care what the rulemaking is
going to say, we still have our opinion. And if there are good reasons why we were wrong, so be it.

MEMBER SCHROMSKY: No I don't think we need all this detail. I think the authority --

CHAIRMAN DENARO: If we can have an unanimous opinion on this, I think we should go ahead and say it. So I think we can work that problem.

MEMBER McCORMICK: I would like to go back and capture what you said was the second item because I didn't take that down.

MEMBER SCHROMSKY: Flexibility.

MEMBER McCORMICK: The one on being able to be resilient?

MEMBER BERG: So I think there should be a known process for somebody like Intel or anyone else who is in this, who likes to do this, to advise of such a vulnerability. Because I am not sure there is a way to do that. And I don't think, as
you said, I don't think it is sending Ken an
e-mail. But I don't know what the right one
is. But there should be a way of --

MEMBER McCORMICK: And given the
external verbiage, that was really what --

CHAIRMAN DENARO: I like that.
Scott, why don't you and Roger work together
on that and come up with something that you
put that we all review and then we will take
a look at it.

MEMBER McCORMICK: Okay.

CHAIRMAN DENARO: And give us a
little preamble on that. Just say why you
are bringing that up. I think there are some
good reasons.

MR. LEONARD: And obviously, once
there is a security management system, that
would be the obvious place to report
vulnerabilities.

CHAIRMAN DENARO: Right, once it
is operational.

VICE CHAIRMAN KLEIN: And
presumably once it is operational, they will have a process in place.

CHAIRMAN DENARO: Well, that is one of the things that I don't want to presume. I think Roger has got a point. Let's make the recommendation. If the answer is well, yes, that is number three in their thing, well good. That is good to hear. So let's make the recommendation.

Okay.

VICE CHAIRMAN KLEIN: Nineteen minutes.

CHAIRMAN DENARO: Is that all you have got, Scott?

MEMBER McCORMICK: That was all we had.

CHAIRMAN DENARO: Anything else? All right. Any last comments you want to make on where we have been?

MR. LEONARD: Well, this is my second Program Advisory Committee meeting. I, again, want to thank everybody. I really
do appreciate the exchange, the discussion, the energy that everybody has brought and obviously, in working outside this room as well. I mean the work that Intel did, the checking you have done with William and others to bring issues like this, just the breakout sessions and the issues that people were raising.

I appreciate the response to the request that I made at the last meeting. It does help as we respond back to Congress to be a little less insular in just saying this is what we have been thinking in the Joint Program Office. This is the true value of having a Program Advisory Committee is that diversity of perspectives, those additional insights. We are 17 people and we are limited to what we can think of and imagine and address.

And so I really do appreciate everybody's participation and I am looking forward to these recommendations and
continued activity on the program. Remember your terms don't end for another half a year yet.

CHAIRMAN DENARO: That is March fifth, we hear, whatever. March something, yes.

MR. LEONARD: And I guess I would add that we are starting the process now because we have to put a roster of names forward to the Secretary of folks to nominate for the next term of the Advisory Council.

So I will put it in these terms. If there are people who have had enough of the Advisory Committee experience, let us know. We certainly don't want to nominate people who have felt they paid their dues and have had enough fun. But it is a process that I really do appreciate.

And we have certain requirements that we have to meet in the names we put forward. And of course, to get that in through multiple levels of the organization.
but we are starting that process. And so if
you have an interest in staying on the
Program Advisory Committee in any capacity,
please contact us. Steve is starting the
process of selecting names now.

And again, just thank you all.

CHAIRMAN DENARO: All right.

Thank you, Ken.

All right, let me mention some
next step type things. First of all, all of
what we just did, again, to reiterate what I
would like. I think each of the
subcommittees have a little wordsmithing to
do and so forth, mine included. So I would
like you to do that. And then email, and
let's email to both Hans and me, both.

VICE CHAIRMAN KLEIN: No, just to
Bob.

(Laughter.)

CHAIRMAN DENARO: And that way,
between the two of us, we will be sure to see
it. And let's have a deadline on that of two
weeks from tomorrow.

MEMBER McCORMICK: I am unavailable for the next two weeks.

CHAIRMAN DENARO: Oh, all right.

MEMBER McCORMICK: I can do it three weeks from tomorrow.

MEMBER SCHROMSKY: You've got Labor Day. So do you want to do the week after Labor Day?

CHAIRMAN DENARO: Sure.

MEMBER McCORMICK: I can do it the week before Labor Day.

MEMBER SCHROMSKY: So everybody's schedules back to school and all.

CHAIRMAN DENARO: That's fine, three weeks. Shall we make it a Monday so you have over a weekend? August 30th?

MEMBER SCHROMSKY: That is the day before Labor Day weekend.

CHAIRMAN DENARO: August 30th okay?

MEMBER SCHROMSKY: The Friday
before Labor Day weekend.

CHAIRMAN DENARO: Okay. So then what will happen is give Hans and I -- well we need to commit, too. So we will commit within two weeks of that we will get back to you a recommended final list of recommendations all for your review.

At that point, --

VICE CHAIRMAN KLEIN: Friday August September 13th.

CHAIRMAN DENARO: -- we will ask for comments back from you and we will probably make that about a two week period also for comments back.

Now if we get substantial comments, it means we will have to iterate a little bit. So we will kind of play that by ear when we see what happens.

I am not going to say either don't make comments or am I going to say don't avoid it. I mean, if you think of
something between now and then that we really forgot and really should be in there, please, go ahead and bring it up. If we can get support from the rest of the committee, we can go ahead and address it. I don't have a problem with that.

So that will be the process going forward. We are going to shoot for -- and Ken, remind me. I think we said like December-ish that we wanted to get this to you as a deadline.

MR. GLASSCOCK: At the very latest.

CHAIRMAN DENARO: At the very latest.

MR. GLASSCOCK: It is due to Commerce February 1.

CHAIRMAN DENARO: Okay.

MR. GLASSCOCK: And so if you just backtrack it with all the government procedures that have to take place.

It will be December 1. It will
be very doubtful it gets to Congress by February 1.

MEMBER ALBERT: Why don't we just do it before Thanksgiving?

CHAIRMAN DENARO: Say again?

MEMBER ALBERT: Get it done before Thanksgiving.

MR. LEONARD: That would certainly give us a chance to review it and get it up to the Secretary's office before the New Year and give them a month.

MR. GLASSCOCK: Because it still goes to OMB. I mean that is how it is circulated.

MR. LEONARD: Once we get it, it took four months to get it through the system. There was a transition going on. But it goes through many hands.

MEMBER McCORMICK: The other suggestion that I talked to Bob about, there were some things I thought were not characterized the way I recall them on the
last minutes. And so I would ask if we could --

CHAIRMAN DENARO: Yes, I am going to get to that, Scott.

MEMBER McCormick: Oh, okay, sorry.

CHAIRMAN DENARO: I am going to bring my calendar up here. I am guessing at all of this. I have got to stop doing that.

All right, so we just said August 30th for getting stuff back to us. We said two weeks-ish Hans and I getting a version back to you. That puts us something like September 20th. We said turning that back around, that brings us to October 4th-ish.

So that gives us basically the month of October to iterate and crunch and get things done to shoot for an early to mid-November. So I am going to say November 8th is when I am going to shoot for us attempting to get a final version, which is a Friday.

So that will be our target. And
if going up to that we see any problems, we can bring that up.

Okay, so that is going to be the schedule for the memo.

The NHTSA letter, which we had to finalize at this meeting, guess what? It's gone. No more comments. It went. It is already in Steven's hands. Your names are all signed. Thank you very much. So that is done.

The deliverable on the --

MEMBER McCORMICK: On that letter, were you able to incorporate the Board's comments?

MEMBER KENNER: The ones we agreed on yesterday.

MEMBER McCORMICK: Okay, good. Thank you.

CHAIRMAN DENARO: And then --

MEMBER KENNER: We still have the word enormous in there.

(Laughter.)
CHAIRMAN DENARO: And the strategic plan review, frankly, I think you got much of what you wanted in real time while we were talking. We can turn that into a short memo, if you want. I mean would you want something in writing?

MR. LEONARD: If it would be easy but I would say there are other things that you are working --

MR. GLASSCOCK: Bob, there were people back here taking notes.

CHAIRMAN DENARO: Okay.

MR. LEONARD: But if you have any additional thoughts.

CHAIRMAN DENARO: All right, good. So we will do that, I think. It is not going to be done at this point. Because I think we had a good session. I saw good notes being taken both up front and in the back. Okay.

And Hans will work on this deployment. You have the good notes there
and all. We will turn that into a short
document and maybe some more thoughts on
that.

Okay, then two other things. I
did get a request on the minutes that we
circulate that to all of you to take a look
at the minutes. And that is a fair request.
So we will do that next time. So it takes a
while. Steven, basically gets the minutes
together, sends it to me. I will get that
immediately out to all of you for any
comments. And then basically I have to sign
it, get it back into him and then it gets
posted.

So before it gets posted you will
have a chance to look at the minutes, which
we should have been doing.

And the last thing then is
another meeting. The only thing in my mind
we are really working on at this point is
getting this final recommendation done, which
we just set a date now for November 8th of
actually finalizing that.

I have good news and bad news about another meeting and they are the same. And that is, we can't have a physical meeting. So we will not have a physical meeting.

I do recommend that, however, prior to that final document that we have, let's call it, a webinar just so we are all talking together, rather than trying to do it piecemeal through the emails.

So given that schedule we just came up with, I am thinking of a webinar in the last week in October sometime, which gives us a little over a week when we have the final document. Does that sound like it works? Not specifically the date, but that format. Okay.

MEMBER KISSINGER: Is there any chance to get a briefing on the pilots?  
CHAIRMAN DENARO: On which? Oh, the pilot.
MR. LEONARD: The safety pilot? I'm sure there will be information updates on the safety pilot by October.

CHAIRMAN DENARO: So that would be great if we could maybe even make that an agenda item, if it is available. That would be cool. Yes, that would be a good idea. Thanks, Peter.

So we will get a doable Doodle poll out on that and look for a day in probably -- I mean so long you would be on the phone but I am thinking a three or four hour meeting on the phone or webinar.

Any other suggestions on what we need?

One very important thing is I want to thank Steven, and Charlie, and the rest of the staff for arranging this meeting, location, the food was great, staying upstairs and coming down in your bathrobe to the meeting is kind of cool, a bigger room, good acoustics. Thank you very much. This
worked out well.

(Applause.)

CHAIRMAN DENARO: Okay. With that, I think we are adjourned.

(Whereupon, at 3:54 p.m., the foregoing meeting was adjourned.)