

UNITED STATES DEPARTMENT OF TRANSPORTATION

OFFICE OF THE ASSISTANT SECRETARY FOR
RESEARCH AND TECHNOLOGY

INTELLIGENT TRANSPORTATION SYSTEMS
JOINT PROGRAM OFFICE

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INTELLIGENT TRANSPORTATION SYSTEMS PROGRAM
ADVISORY COMMITTEE

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MEETING

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WEDNESDAY
DECEMBER 7, 2016

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The Committee met in the Monument View Room, DoubleTree Crystal City, located at 300 Army Navy Drive, Arlington, Virginia, at 8:30 a.m., Sheryl Wilkerson, Committee Chairman, presiding.

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PRESENT

SHERYL WILKERSON, Chair; Michelin North America
STEVE ALBERT, Montana State University
SCOTT BELCHER, Telecommunications Industry Assn.
JOSEPH A. CALABRESE, Greater Cleveland Regional
Transit Authority
JOHN CAPP, General Motors Corporation
BOB DENARO, ITS Consultant
DEBRA JOHNSON, Long Beach Transit
J. PETER KISSINGER, Consultant
SCOTT McCORMICK, Connected Vehicle Trade Assn.
TINA QUIGLEY, Regional Transportation Commission
of Southern Nevada
RAJ RAJKUMAR, PhD, Carnegie Mellon University
BRYAN SCHROMSKY, Verizon Wireless
SUSAN SHAHEEN, PhD, University of California,
Berkeley
KIRK STEUDLE, P.E., Michigan Department of
Transportation
GEORGE WEBB, P.E., Palm Beach County, Florida

ALSO PRESENT

STEPHEN GLASSCOCK, Designated Federal Officer
SHEILA ANDREWS, Auto Care Association
STEVEN BAYLESS, ITS America
JASON CAMPOS, Noblis
JOHN CRAIG, Noblis
ANDREW FOSINA, Signal Group D.C.
REGINA HOPPER, ITS America
MICHAEL LAND, ITS America
KEN LEONARD, Director, ITS Joint Program Office
KATHRYN McGIRK, M + Q
IAN REAGAN, IIHS
JOE REGISTER, Auto Care Association
MADELINE SALINAS, Harris Wittshire & Grannis
EGAN SMITH, Managing Director, ITS Joint Program
Office
AL STERN, Citizant
RON THANIEL, ITS America

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

8:28 a.m.

CHAIR WILKERSON: We're going to get started.

MR. GLASSCOCK: Good morning, everyone, and I will go ahead and officially open the meeting. Welcome, everybody. Glad you could make it.

A few housekeeping items. The restrooms are out the door and to the left. We have the court reporter reporting everything. So, he would love it if you can identify yourself every time. We'll see how it goes, but he has a seating chart.

If there's any issues or anything, please let me know. I want to make sure that you're comfortable. It's going to be a productive day for us.

And with that, I'm going to turn it over to you.

CHAIR WILKERSON: Okay. Well, good morning. I hope everyone is well and had a safe journey. A lot has happened since our last meeting.

We had a presidential election and many of you have had news in your respective industries that you've shared with us along the way.

So, I think before we begin, maybe -- are there

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any announcements that anyone would like to make? I know Tina showed up a little late yesterday, but she shared.

But if anyone around the room since we haven't seen each other in a while, would like to either give us some updates or maybe tee up -- usually during the meetings we're always saying "Here's a meeting that people should know about." So, this might be a good opportunity to share some of that before we introduce the other guests in the room.

Tina, do you want to start?

MS. QUIGLEY: Well, I'll start by talking about - there's been lots of conversation about how ITS can -- will help not only in the arena of safety, but increasingly in the arena of infrastructure efficiency, you know, within the agency. So, we do the buses, we do the ITS, we also do the roads. And so, it's becoming very clear to us that if we've got a well-timed corridor or if there are ways of using technology for managing roads more efficiently, then we've saved that much more money in the investment in the asphalt.

And, you know, if you have to invest in asphalt or you have to invest in technology, I think technology is going to win every time in terms of cost efficiency.

What it's going to become is, I think, a challenge

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for me, is just to really start to message that to our elected officials so that they are -- and our public so they are comfortable in starting to shift budgets and philosophy a little bit more towards technology. And I'd like to see more research or start to push more research in terms of how technology can help manage infrastructure.

We've created what we call the Nevada Center for Advanced Mobility, which is a partnership between the university, the state, the Governor's Office of Economic Development, the RTC, to actually start to create like a grant program for issuing RFIs related to problems that we need private sector to help us solve.

In particular, right now we're very focused on that -- and we'll talk more -- when we get to pedestrian safety, but focus very much on how we start to pull in technologies to help us with our pedestrian fatality problem. So, we're doing an RFI on that right now.

CHAIR WILKERSON: Any other announcements for meetings or issues in your respective states?

DR. SHAHEEN: Oh, I've been -- I've been working really hard the past year to put together a one-day workshop at TRB.

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So, it's going to be on Sunday and it's going to feature the Smart City Challenge and the Federal Transit Administration Sandbox project. So, that's going to be on a Sunday at no additional cost.

And it's pretty serious palette of speakers, you know, everyone from the White House to Columbus that won, and to a number of the sandbox projects that won. There's a total of 11. And there's going to be a lot of automation included.

CHAIR WILKERSON: Great. Thank you.

MS. QUIGLEY: Yes.

CHAIR WILKERSON: Okay. Well, thank you.

I'd also like to thank Stephen and Ken and the team for their support of the past several weeks. They have kept us up to date, provided some new charts for all of us. So, we really appreciate that.

For the record, three of our members aren't able to attend; Joe McKinney and Roger Berg.

And I think Kirk will be coming a little -

MR. WEBB: Yes. He's coming a little later.

CHAIR WILKERSON: He's coming a little later today.

MR. WEBB: He had a flight that just got in.

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CHAIR WILKERSON: And I know that one of you, at least, has an early flight you need to take. So, we'll -- we've adjusted the schedule accordingly.

We all have our visible nameplates, but we have some public attendees here. Maybe you could stand up and introduce yourselves so that everyone around the table knows who you are.

MR. CRAIG: Hi. I'm John Craig. I work for Noblis.

CHAIR WILKERSON: Okay. Great.

MR. REGISTER: And I'm Joe Register. I'm with the Auto Care Association and I'm active on the ISO-DC-204 Committee. And I'm very interested in what you're doing here.

CHAIR WILKERSON: Thanks to both of you. We really appreciate that.

(Off record comments.)

CHAIR WILKERSON: So, Stephen, Ken, do you have any other -- do you have any other comments, or Ken?

MR. GLASSCOCK: He's coming, too.

CHAIR WILKERSON: Okay. Great. So, we'll wait.

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So, everyone has a copy of today's agenda. We've made just one adjustment, which I'm not sure you all have, but -- okay. The rural development and technologies were switched in the interest of time. So, I hope that's okay with you all.

Are there any questions about the agenda? There are a few here that I can pass out if you didn't bring one.

MS. QUIGLEY: We don't have one.

CHAIR WILKERSON: Okay. Sure.

(Off record comments.)

CHAIR WILKERSON: So, while everybody's getting those, I'll just remind, then, we'll start at 8:30 with our Traffic Safety Culture Subcommittee. We'll take a break at 10:00.

10:15 we'll again begin with the Automation and Interrelation between Connected and Automated Vehicles. We'll break for lunch for a half an hour.

And then we'll have the Rural Development Assistance Subcommittee at 12:30. And then break. And then follow with the Technology and Active Transportation Subcommittee. And then I'll close with a discussion of our action items.

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One of the things I would like to just tee up is just remind folks we had -- the last meeting we had was in August. We had the last advisory memorandum, which was submitted on October 5th. And the last reports to Congress was in early 2016.

Do we have a copy of the timeline that we can --
(Off record comments.)

CHAIR WILKERSON: Okay. Well, we'll, at some point, put that up on the screen. Usually at some point during the meeting we're all asking what's the next step, what do we need to do? So, we'll make sure we get just a few highlights, but I think the next if we want to have any advisory recommendations, it will be sometime -- we generally do it in the first part of the year like January or February.

And then we'll look at possibly -- one of the recommendations is to possibly have a conference call between -- sometime between January and February. And then talk about a meeting sometime between late March, early April.

So, maybe at the end of today's meeting we could think about some of those dates. And if you have other ideas, we'll talk about that at lunch.

So, during our last meeting, we discussed and

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prioritized several key issues. And we highlighted some subject areas that we would like to address in the coming year. They were technology and active transportation, rural development, automation, interrelation between connected and automated vehicles, and traffic safety culture.

And then we also said that we want to take a hard look at what -- the recommendations that have been made thus far.

Stephen was kind to send that around to everyone. We are not going to spend a whole lot of time today talking about that. We thought we'd spend more time on the subcommittees themselves.

And I think in the interest of the Advisory Committee, it might be helpful for all of us to take a look at those recommendations. I read them. I think there's been a lot of accomplishment to date.

I did not see anything that was blurry that I thought needed to -- a lot of attention, but I thought maybe between now and our next call we could spend the next call talking about those and getting the advisory committee members' assessment on those recommendations and what DOT -- the Joint Program Office, has done to date.

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So, I would sort of recommend that we kind of defer that topic unless someone else has some major, glaring issues that they'd like to bring to our attention, but then focus the call in January or February to talk about those.

MR. McCORMICK: You just asked me to do that committee a couple days ago.

CHAIR WILKERSON: Yes.

MR. McCORMICK: Do you have the list of who has signed up for each committee? Because I don't have that --

CHAIR WILKERSON: Yes, we do. I can pull that up. Should be here. I don't know if we printed those out, but I do have a -- it was sent in the email --

(Simultaneous speaking.)

CHAIR WILKERSON: We can go over that. Here's the printout. From the Traffic Safety Culture it was Debra Johnson and Tina --

(Off record comments.)

CHAIR WILKERSON: We can circulate those. And we had the ITS program accomplishments. It was myself and Ginger. So, if you'd like to work on that, that would be fine, too.

John and Roger for the Automation. Scott on the

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Technology and Active Transportation. And Steve Albert and Bryan on Rural Development. So, this pretty much follows the schedule today that we have on the agenda.

Any other questions? If not, we're going to jump right in to Traffic Safety Culture with Debra and Tina.

Would you like to -- you have the floor.

MS. JOHNSON: Sure. Basically, Tina and I had an opportunity to chat and we're really excited about, you know, shepherding this endeavor to talk more about traffic safety culture and delving more deeply into what's happening collectively.

As we all know in the current environment and so forth, you have competing priorities. You have this very active aspect of looking at roadways and then, again, you have this element of distracted drivers, distracted pedestrians and so forth and having those competing priorities when, in fact, trying to look at mobility and how to shepherd people along.

And so, what we hope to delve into as we carry this committee forward, is talk about the things that are most prevalent to us and what we can do here as a body of the ITS Program Advisory Committee and put forward our ideas of what

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actually -- what we could tackle that are very tangible in the near future.

I'd like to turn it over to Tina, because she has done some things within her jurisdiction that I think would be very, very germane to the discussion that we'd like to have today.

MS. QUIGLEY: So, sure. So, Las Vegas has one of the highest pedestrian fatalities in the nation. And for the most part, it's due to impaired drivers and impaired pedestrians. It's also due to distractions.

But we've also compounded the problem by designing a lot of distractions on some of our arterials; even though we might post them at speeds of 45 miles an hour, they've been designed where they're wide, seven lanes, flat, straight. And then we really misjudge the distance between crosswalks is so significant that people are confused; inevitably human nature is you're going to go ahead and cross whenever it's convenient for you.

So, most of our fatalities are occurring not on the "Strip" where you might think or in those highly-dense resort corridor areas. Instead, they're occurring in our residential areas where we just designed it so that it's

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almost -- it doesn't encourage, but it doesn't distract.

So, recognizing that, we want to start to start doing some RFIs, requests for information; but globally, we've left the pedestrians out and we're offering grant opportunities for small businesses or existing businesses who want to come in and test and deploy anything in helping us resolve that.

And I'd like to eventually come to share our ideas once we go through this process, share it with this committee as lessons learned and just ideas, because we let it out globally. We actually had over 70 -- no, we had 41 respondents to the RFI, which very few came domestically. Most came from Europe and Israel, most of our responses did.

So, there was no response that actually was a panacea, one-size-fits-all, you know, approach to solving the problem, but there were different responses that we are going to be exploring further.

Some are actually apps on your phone that just make you aware, that are going to force you to, make you more aware of your environment. I have to go through the list, but we've chosen about seven that we're going to explore further relationships with and offer some grant opportunities to.

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Let's see, what I'd love to be able to do is to involve the committee, and I apologize, I haven't been to the past two meetings, so I'd love to spend more time with the committee members talking with them about how we might collaborate to learn what each one of their, or any of the jurisdictions, are doing in this area to start to pull in technology -- okay. Wait. I had another thought. Hold on.

So, the other reason that I think that this type of conversation is so important, is because this is one thing that, you know, in the end, it all comes down to funding.

We're going to need funding for whatever it is. Whatever type of recommendations we end up making, whatever it is that we want to advance, you're going to need federal funding, local funding or you're going to need elected official support.

Elected officials, in the end, love safety. They love statements like, "In six months we're going to reduce fatalities by five percent," things like that.

So, the more that we can tie advancing technologies into sound bites or goals that elected officials like and want to see happen, the more funding you're going to start to see directed maybe away from roadway capacity

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issues, which I'm okay with, and more towards safety and technology capacity issues. So, I guess that's it that I have to report for.

CHAIR WILKERSON: That's great. There was an article -- I mean a story on NPR while I was driving here.

MS. QUIGLEY: Oh.

CHAIR WILKERSON: I don't know if anybody else heard of it, D.C.'s "Vision Zero" on safety, to reduce their fatalities. So, that was just this morning.

MS. QUIGLEY: Yes. Vision Zero, we have. Yes.

MR. McCORMICK: Well, and on that, there's also the Road to Zero Coalition, which is having their meeting on December 15th here.

And when I talked to them, you're supposed to be able to have dial-in for it as well. I'm not getting on another plane this year.

MS. QUIGLEY: Any comments?

MR. WEBB: I'd just like to chime in that if they do have a bad rate, I think ours is double yours in south Florida.

MS. QUIGLEY: Is it?

MR. WEBB: We, unfortunately, probably lead the

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nation along with Orange County/Orlando area as far as fatality rates for pedestrians. And we're trying desperately to figure out how we can make our roadways safer. And it includes bicyclists as well in our area.

So, the other thing that we're trying to deal with is in the old "Complete Street" movement, probably should address that issue as well.

MS. QUIGLEY: It's a really big deal especially because it's so costly to our society, right, if somebody is just severely injured versus dies.

And I know that, yes, I know it's hard to say, but sometimes you have to talk about the economics of it in a larger ecosystem in order to really get people to understand.

This isn't just kind of touchy-feely, let's have a safe environment. This is about money, too. This is about taxpayer dollars.

The more that you can preclude these from happening, these deaths or severe injuries that are costly to take care of, you know, the overall economic impact to taxpayers is reduced.

So, that's a conversation I know it's so painful to have, to monetize that kind of conversation, but I feel

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like you have to do it in order to get, again, the funding that you're going to need to take on things like Complete Streets or safety issues.

MS. JOHNSON: I'm interested in knowing in some jurisdictions, have you all taken steps, more or less, to restrict cars on certain arterials?

I know a lot of major cities have done that. When I was in San Francisco, we did that. We're doing certain hours like on Market Street, which is a major thoroughfare, in the City and County of San Francisco whereby cars weren't allowed, only open to, you know, taxis, which is the transportation provider there and so forth, and there was a lot of traffic enforcement.

And it was due to the fact that they're, you know, the City and County adopted a zero, you know, tolerance policy. Moreover in my current jurisdiction in Long Beach, the second largest city in LA County, we've done various things like that.

And to introduce it, we've adopted the "Open Streets" program that was adopted from, you know, Colombia whereby certain days of the month it's restricted only to active transportation relative to bicyclists, you know,

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pedestrians and so forth cultivating that street movement in and about without vehicle traffic.

So, with that being said, has any jurisdiction in your respective areas done anything such as that?

MR. BELCHER: This is more a comment than a question. When you -- I found when I'm dealing with a lot of the bike and pedestrian folks, what comes out culturally is that everything in the United States is designed for the automobile.

MS. JOHNSON: Yes.

MR. BELCHER: It's not designed for the pedestrian, it's not designed for the bicyclist, it's all about the car.

And culturally, then, how do you make those changes to institutions where they are more focused on pedestrian and bike than they are just about vehicular movement?

MR. McCORMICK: Well, interestingly, the city of Detroit did something very -- what I felt was very thoughtful and interesting, is that along a section of roads, they actually offset --

CHAIR WILKERSON: Scott, I think they -- if you

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could just mention your name?

MR. McCORMICK: Oh, sorry. Scott McCormick.

CHAIR WILKERSON: Because on that side, I don't think he can see the name cards.

MR. McCORMICK: Okay. What they did was they offset the parallel parking by about two and a half, three feet. They painted a line down there and that was specifically for pedestrians and bicyclists so that they were buffered by the parked cars.

And I talked to Mike Duggan, the mayor, at the World Mobility conference recently, and he said that it's been extremely effective, you know. They were originally concerned about people opening doors or whatever and he said, but they've had no injuries, no accidents, no problems.

And he said that it's been working quite well and the only issue is that on existing roads that aren't wide enough, you can't really add that to it. He said, but in the places where they did have it and particularly the older roads where they could add that two feet or more, you know, just for riding between the curb and the parking. I thought that was quite innovative.

MS. QUIGLEY: I'm going to answer your question.

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It comes down to regional leadership.

PARTICIPANT: Right.

MS. QUIGLEY: In the end, it comes down to what is the culture of your community, you know.

We've spent a lot of -- I've spent a lot of time trying to learn from mentor cities like the Denver, Salt Lakes of the world. And they can always trace back to 20 years ago where they had a strong mayor, or they had a strong county commissioner or leader who said, "This is what we're going to do."

And in doing that, that sets the tone for the public works directors and the planning directors that said that's what they're going to do. And then it kind of just, you know, the domino effect.

And then in those cultures -- I'm in one where we just haven't had that leadership, it's been more about the automobile, and having public works who just design high-speed lane miles.

It's unfortunate, but just a key number of people, you know, ten people can shape the culture of a region for the next 20, 30 years and it's really frustrating.

That's why I want the economics eventually to

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start to get into this conversation, because then you're forcing even those traditional vehicular designing-focused public works directors to have to accept that there's more cost benefit analysis to this other type of design and it's really hard. So, leadership.

MR. ALBERT: Thank you.

CHAIR WILKERSON: Bob.

MR. ALBERT: I'd like to talk to you on the side.

MS. QUIGLEY: Yes.

MR. DENARO: When Gabe Klein was the DOT director in D.C., didn't he do a lot of good work with really trying to change road use and laneing and so forth to really emphasize bikes, in his case, bike programs and that sort of thing?

I read his book and it seemed like he had quite a bit of innovation there and figured out how to get it through, you know, the government as well to implement it.

MR. LEONARD: This is in Chicago?

MR. DENARO: No. He -- well, he did -- in Chicago, he did it also, but he did it first in D.C.

MR. LEONARD: Yes.

MR. DENARO: Yes.

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MR. LEONARD: I don't know where he is right now, but I know he did a lot in D.C. and then was working the same issue in Chicago.

MR. DENARO: Yes.

MS. JOHNSON: And to Tina's point, I think it's very important. I'm actually, as I said, out in California. And just recently in LA County, we passed a half-cent sales tax measure that goes on, you know, without a sunset date that's being reinvested into the infrastructure.

And I know in other areas in California, a lot of those passed and it required a two-thirds vote.

And with that being said, it really does go back to the leadership and who's in support. And not only is it going to help growth, however, you know, transit infrastructure and other aspects in reference to pedestrian facilities, utilizing major crosswalks and things along those lines and having a shared coexistence-type mentality around, you know, the shared mobility aspect.

So, I just wanted to reiterate that, because I think it really, really does make a difference who's at the helm and how you can basically coalesce those people to sort of rally around the flagpole and come full circle in reference

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to changing the ideology around key elements of transport.

I think that is just pivotal if we're going to see some kind of change.

MR. SCHROMSKY: So, the question I would have, I guess, Tina --

MS. QUIGLEY: Sure.

MR. SCHROMSKY: -- with respect to Las Vegas, right?

MS. QUIGLEY: Oh, okay.

MR. SCHROMSKY: So casino industry and development and I'm sure there's some casino redevelopment authority and transit money.

One of the things in my experience, and you can see all that out here and Ken and I were talking about this, these weren't here in the '70s '80s; right?

So, you mentioned the economic piece, right? So, we see this demographic shift where people lived and worked in the city, and then we went to suburbia.

MS. QUIGLEY: Right.

MR. SCHROMSKY: That -- obviously the priorities changed and went to bring the masses in.

So, now we have -- culturally, we have baby

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boomers/empty nesters. Retirees are probably moving to southern Nevada. You've got tourists coming in, and then you have your millennial generation that want to work, you know.

So, it seems to me what we see on the east coast, and being in Baltimore we're starting to see more discussion around pedestrian, more about bikes than we have before --

MS. QUIGLEY: Sure.

MR. SCHROMSKY: -- because people live and work now and we see this cultural change --

MS. QUIGLEY: Right.

MR. SCHROMSKY: -- and really, the economic engine is growing. That's why you see the cranes, right? The majority of those high-rises we're seeing are all residential and some office buildings. And we're seeing that -- an explosion.

I'm just curious to see -- you mentioned the economic piece. Are your leaders starting to see that and --

MS. QUIGLEY: No, not yet.

MR. SCHROMSKY: Because I look at Las Vegas, right? I would wonder just as a hotel industry, right --

MS. QUIGLEY: Sure.

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MR. SCHROMSKY: -- all of the service personnel that work in those facilities, which is massive and I didn't even count the tourists, how many of those actually take public transportation or live within walking distance of this? And my guess it's a very low percentage.

MS. QUIGLEY: Of visitors, I don't know. But what's interesting is that when we poll visitors, they'll say -- well, you know, would you take light rail if you had it?

You know, we're the only city that does not have connectivity between its airport and its central business district through some form of mass transit, light rail, which is completely horrifying to me.

But we'll poll and would you take -- yes, I would take light rail. That's easy to do when it's just a poll, but a lot of them will come from cities where they're at least semi-familiar with mass transit or light rail.

And the international visitors in particular, it's just part of their -- that's the first thing they do. They get off the plane and they're like, you know, where's the mass transit, where's the light rail to the resort corridor?

So, but you're right. You know, it's very

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important we go back to leadership to understand, those who are in the decision-making power to lead or not lead a mass transit conversation, have never taken mass transit.

I had a conversation with the CEO of the Wynn the other day, general counsel of the Wynn. And she was saying that she just doesn't understand, you know, mass transit, she's like "I don't even understand Uber." She said, "They put me on a budget. I have to take Uber now. And I did it and it was raining and I was crying. So, I just called the CFO and I said, ``please, please, can I have a black car?"

Okay. So, if that's the type of leadership and, you know, when you're the CFO, you're the head of the Wynn, you have some influence over community conversation.

MR. LEONARD: We'll put her on the short list for the revolution.

(Laughter.)

MS. QUIGLEY: So, oh, my God, it's so -- they're so cute. All of them are.

So, the only way we're going to be able to have a real conversation about mass transit, about investing in a safety culture, is to start getting it down to economics or to start talking about why, you know, why we have to do

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it for the sake of our economy. That's the only way we're going to get there.

CHAIR WILKERSON: So, Egan, you had a comment?

MR. SMITH: Yes, just a quick comment to tie into the safety question that you asked earlier.

Is there conversation bubbling up to leadership on the safety concerns?

MS. QUIGLEY: Yes.

MR. SMITH: And the costs associated with safety, but to also tie it back to the economics of it as well.

MS. QUIGLEY: Okay. So, yes and no.

MR. SMITH: It's about safety and economics.

MS. QUIGLEY: Not yet. So, yes to safety. So, public officials, elected officials love the safety. Love saying, "Yes, I want to invest in something that's going to reduce fatalities by five percent in six months' time or whatever it is." Love that, but they love it for the sake of loving safety and loving their constituents. They haven't yet tied the business case to it.

And that's one of the -- I don't know that the nation as a whole -- do you guys feel like the nation as a whole has done a good job of tying safety investments into

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-- for economic and business case reasons?

MR. SCHROMSKY: I think we need an actuary.

MS. QUIGLEY: Yes. I mean, if it's out there, I just -- I'm sure it's out -- I'm sure economists have done it, but sometimes those numbers are just so ubiquitous it's hard to really, really relate --

MR. SCHROMSKY: They skew it ---

MS. QUIGLEY: Yes.

MR. SCHROMSKY: -- depending on the data set.

MS. QUIGLEY: It's hard to make it tangible, you know.

MR. SCHROMSKY: Until it affects you.

MS. QUIGLEY: Yes.

CHAIR WILKERSON: Peter.

MR. KISSINGER: I just want to point out that at the national level, there's been a lot of dialog on safety culture.

MS. QUIGLEY: Right.

MR. KISSINGER: Which is sort of an amorphous --

MS. QUIGLEY: Yes.

MR. KISSINGER: -- kind of term. And part of what's happened is that through a series of workshops that

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Steve's center hosted, TRB workshops, AASHTO, which I presume everybody knows, pretty much took the lead and developed what was originally to be a national strategic plan on safety.

MS. QUIGLEY: But just even that sounds so ``government'' --

MR. KISSINGER: And a big portion of that plan dealt with changing the culture relative to safety. Because those of us that have sort of worked in this arena for some time, first of all, realize that the culture of safety with respect to the nation, with respect to the average citizen.

And what we've seen and expect then is an attitude that we've described as "Do as I say, not as I do."

Because if we ask people, for example, is it okay to drink and drive, everybody says "Absolutely not. It's a risk to myself, to my family members." And then if you ask them and they do it, large numbers of people still say they do.

So, and sort of the thrust of the safety cultural movement, in my opinion, probably the most important aspect of it has been to try and raise the level of support for safety, because everybody -- every public agency that I know says exactly what you say. Safety is our top priority.

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And yet when it gets down to allocating resources, when it gets down to doing things, often that falls very short. It's just rhetoric and it isn't really acting.

So, you know, part of the emphasis here really is to try and create a climate within the electorate, within the American public so that everybody views safety as a top or a higher priority.

And if we get to that point, then public agencies, the leadership will be much easier for them to make those kind of changes because without support, you know, it's very, very difficult.

MR. McCORMICK: Well -- and this is Scott --

CHAIR WILKERSON: Before --

MR. McCORMICK: Go ahead.

CHAIR WILKERSON: I know Steve wanted to say something. We have some more guests that have arrived.

So, maybe those of you who did not have an opportunity to introduce yourself could stand up and let everyone know who's here and who is represented.

MS. ANDREWS: Sheila Andrews with the Auto Care Association.

MS. MCGIRK: I'm Kathryn McGirk with the

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consulting firm McAllister.

MR. McCORMICK: I'm sorry, I couldn't hear you.

MS. McGIRK: Oh, I'm Kathryn McGirk. I'm with the consulting firm McAllister & Quinn.

MR. KISSINGER: Can I just -- Sheryl, I just want to add one thing.

CHAIR WILKERSON: Thank you.

Anyone else? Did you --

MR. FOSINA: My name is Andrew with the consulting firm Signal Group.

CHAIR WILKERSON: Signal? Okay. Thank you.

MR. KISSINGER: I just want to add one thing to the point about monetizing the benefits. There's been an awful lot of work on that. I mean, there's national studies that monetize it, you know, \$800 zillion dollars have been spent every year to grow and it's certainly important to do that, but there's also a great body of literature that says those statistics don't really reflect the program.

MS. QUIGLEY: Right.

MR. KISSINGER: It's hard to relate to it.

MS. QUIGLEY: Right.

MR. KISSINGER: So, you've got to put a face --

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MS. QUIGLEY: Yes.

MR. KISSINGER: -- you have to personalize it and you have to make people realize that this is not just statistics, that these are real individuals that are losing their lives and being affected by real trauma.

CHAIR WILKERSON: Steve was next.

MS. QUIGLEY: I agree.

MR. ALBERT: This is to Tina. I live in Bozeman, Montana, if you've ever been there.

MS. QUIGLEY: I haven't, but I hope to someday.

MR. ALBERT: And one of the things you've raised is what's the economics -- what's the economics of this?

MS. QUIGLEY: Yes.

MR. ALBERT: What we've seen in our town, is all of a sudden in the last year, the housing prices near downtown -- yes, we do have a downtown -- have more than doubled. And it's all because people want to ride their bike to work and to go downtown, totally.

But we've also seen a huge increase in bike-ped crashes mostly relating to what they call the "right-hand punch" where a car comes down this way and turns in front of the cyclist and gets his.

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MS. QUIGLEY: Yes. Yes.

MR. ALBERT: So, we have been developing some systems for situational awareness of the cyclists, so it creates kind of a detection system around them. And we've built an autonomous motorcycle that doesn't weeble when you wobble, you know, whatever that is.

(Laughter.)

MR. ALBERT: And won't fall over. So, we're trying to hit it from both situational awareness and the system.

MS. QUIGLEY: What do you mean "an autonomous motorcycle?"

CHAIR WILKERSON: BMW -- I just put it on LinkedIn this week, but BMW just talked about that, too. They actually put a -- BMW just announced -- and I can show you the link.

MS. QUIGLEY: Oh, I don't know about that.

CHAIR WILKERSON: Maybe we can tee up a couple of these during the lunch break --

MS. QUIGLEY: That would be awesome.

CHAIR WILKERSON: -- to show you.

MR. McCORMICK: They actually demonstrated a

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police motorcycle --

CHAIR WILKERSON: Yes.

MR. McCORMICK: -- that didn't have anybody on it that could actually pull up next to you, capture your information and issue a --

CHAIR WILKERSON: Yes, you don't have kickstands anymore and --

MS. QUIGLEY: Oh, I want to see that. If you could pull that up, it would be fun. Okay.

CHAIR WILKERSON: Yes. They have lean assist.

MR. McCORMICK: You know, one of the observations, at least an analogy, from the commercial side, years ago -- 15 years ago or more, and John can weigh in on this, safety wasn't a selling point.

You know, if something was developed, air bag, anti-lock brakes, whatever, it became an expectation in the market that that would be in your car. You know, pricing as an option was somewhat taken as an offense. And the same thing was true on the government side.

Back in 2010 when the Minneapolis bridge collapsed, Kirk Steudle met with me the next day and said, "We need to put strain gauges on the Mackinac Bridge, and we

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want to do that in three weeks before the run" where everybody runs across the bridge.

We said, okay, we'll get all the industries to weigh in and help do that. And in kind, in exchange for you giving us, you know, the PR bragging rights on it.

And so, we did all of that. And that the day that it occurred, Kirk came to me and said, "The Governor says we can't say anything about what we did."

And I said, "Okay, that's bad, but why?" He says, "Well, they don't want the press asking -- begging the question that says, well, why are you putting strain gauges on a 50-year-old bridge? Is there something wrong with it?"

And at the time, my 85-year-old mother basically said, "Well, that's stupid. All these bridges in the country were built before we even had computers. We should be monitoring them just like we monitor me, you know, for potential breakdown and decay."

And I don't know that that's really changed. I don't know that we've really seen a community change that says we need to do this maintenance of the infrastructure, the bridges, the pedestrian, all that stuff for safety.

They do it because, okay, there's some macro level

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catastrophic problems that they're saying they need to address, but there seems to be a real reticence and a complimentary issue with how the media wants to sensationalize anything that's done rather than move us forward in a productive way.

CHAIR WILKERSON: So, George.

MR. WEBB: George Webb.

Yes, this is a big issue in my department. I mentioned just how bad we are as far as pedestrian fatality.

We kill probably about 125 people a year on roadways and it's been a big issue for me the last couple years.

And I fortunately have a staff -- we input all of the traffic accidents in our county into a database that we manage and operate, about 35 to 40,000 a year.

And I've asked them to particularly focus on the pedestrian/bicycles and tell me what's the cause of this.

My streets are fairly new. They are the four and six-lane arterials. They have traffic signals. They have crosswalks. They have pedestrian pushbuttons. They have speed limit signs.

They have beautiful medians with nice trees that

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we lose I forget how many trees to motorists every year, including those motorists that are -- that die after they hit the trees. But the community balance is they like the trees, so we don't care if people are dying when they run into the trees. So, again, you have those standards that you have to address on a community-wide basis.

But it's frustrating from an engineering perspective, that I've got a designed roadway system out there that meets all the criteria as far as what should be safe, sidewalks are there, bike lanes are there and so forth, and people are still --

MS. QUIGLEY: What's the speed limit?

MR. WEBB: 45 to 50 is our standard.

MS. QUIGLEY: Yes, that's too high. That's too high.

MR. WEBB: Well, but a typical drive for us, a commute is like 12-15 miles from our suburbs in or whatever around and we don't have necessarily one central city. We are a coastal area.

West Palm Beach is our biggest city, but doesn't have our largest employment. They're scattered throughout. So, mobility is a big issue for us and we're very proud of

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being mobile in our area.

So, but we have that tradeoff again of, okay, we've got it designed this way, it works, but we're still killing people.

MS. QUIGLEY: Well, I'm just going to say it's because of your speed limit, because I don't think you can design those amenities to encourage bikes and peds and yet still -- are they straight roads or are they --

MR. WEBB: Yes.

MS. QUIGLEY: I think you've taken -- you've just put lipstick on a pig a little bit. I don't know.

As long as you still -- so, you post it 45, but you designed it, probably, so that it looks like it's a 65-mile-an-hour road. I'm guessing it probably looks like I can drive that fast.

MR. WEBB: Well, with our congestion, it's 45 or 50.

MS. QUIGLEY: Okay. Right. I got it. Anyway, just a guess, because we do the same thing.

Wow, we got off topic, kind of, but can we come back to kind of how we would explore traffic safety culture as it relates to ITS?

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Any thoughts that people have, direction that people have as to what the subcommittee might take on --

CHAIR WILKERSON: And one other comment I would add is if -- for those of you who have the chart in front of you, we have a list of topics that we raised under traffic safety culture that we highlighted.

MS. QUIGLEY: Yes.

CHAIR WILKERSON: We talked about the behavioral/psychological issues and we have some things that you've addressed that weren't on here, economics and leadership and the urban/rural issues.

And we talked about pedestrian/motorized vehicles, but there was also a comment about aftermarket technology on safety and sharing of path usage; I know you care about that.

Technology enablers and limiters, community involvement, which I guess would go to some of the leadership, helmet safety, distracted pedestrians, funding and procurement, which goes to your economics.

And then we also talked about different speakers, bicycle and pedestrian groups, psychologists with NHTSA and AAA and others.

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So, I just would like to just throw those out there. And then for those who --

MR. KISSINGER: I think the -- honestly, I think the most important thing this committee could do is consistent with what you have raised, is to make the case from this committee that given that safety is our top priority, we should be investing more money in the kind of research that Ken and his group is doing.

MS. QUIGLEY: Okay.

MR. KISSINGER: And not just look at it as, okay, last year they got X amount of money and this year we're going to give them the same amount of money.

You know, I think we ought to be bold enough to consider reallocating some of those resources that DOT has put more emphasis on safety, because that's the only way we're going to eventually make a difference in this.

We can sit around and talk about this all we want to. But unless we actually start making some -- setting different priorities and allocating dollars in a different way, we're going to be having the same conversation.

MS. JOHNSON: Well, I was going to say we have a lot of different thoughts here. And I think if we narrow down

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to what we want to actually do, to your point, Peter, I think that's good. Collectively we can decide what direction in which we need to go, because we have a lot here.

And then if we sort of dabble and dabble in all aspects of that, we won't sort of home in on specifically what it is we'd like to do. But I would agree that collectively steering it back to this committee relative to what our role is here, if that's what we think we should be doing, then we need to place some emphasis on that going forward.

I have another thought and I just lost it.

CHAIR WILKERSON: So, one of your recommendations or something for us to think about, the takeaway for any future recommendation, might be reallocation of government resources for safety -- US DOT resources for safety as it pertains to --

MS. JOHNSON: Yes. Yes.

CHAIR WILKERSON: Okay.

MR. McCORMICK: Well -- this is Scott -- I have one question. I mean, I like the idea that helmet safety is on here, but what we've seen, and talking to Kirk about this, you know, some of the growth in the numbers that they had in Michigan and nationally was because the repealing of all the

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helmet safety requirements -- the helmet requirements for motorcycles.

And as far as I can tell, those were not generated by any commercial lobbying effort. It was all basically individuals that were saying, "I don't want to wear a helmet."

And my question would be, I'm not sure what we can do with regard to helmet safety, because everyone understands the value of it and it's evolved into states saying, "Okay, if I want to get reelected, I'm going to cater to this group of people that don't want to wear helmets."

I'm not sure what we add to that whole picture, because we all know the value --

MS. QUIGLEY: Okay. Let's cross it off.

MR. McCORMICK: -- of helmet safety, but --

MS. QUIGLEY: Gone.

MR. McCORMICK: But what do we do -- what do we do with this?

CHAIR WILKERSON: Well, it goes -- I think it goes back to leadership. It - that issue with helmets, I'm an avid motorcyclist, and I'm appalled. Also, I won't ride in California, because people can ride in the middle of the cars.

MR. McCORMICK: Right.

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CHAIR WILKERSON: So, I mean, I don't like driving there because of that. I was in France this past week, and we were amazed at the number of people who just fly down the highway in between vehicles, but that also is a state issue around the country. So, it goes back to leadership and --

MR. McCORMICK: And they're all encouraged to go to the front of the intersection at a stoplight in front of all the cars.

CHAIR WILKERSON: But it also goes to the culture of those people who ride, right?

MS. QUIGLEY: That's true.

CHAIR WILKERSON: So, I think there are cultural issues from a government side, but there's also a culture from the industry itself, which could --

MR. McCORMICK: My only point is --

CHAIR WILKERSON: So, I don't know --

MR. McCORMICK: -- that we --

CHAIR WILKERSON: -- how you address that.

MR. McCORMICK: -- should probably work on providing advice where it will have value. And helmet safety is one that --

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CHAIR WILKERSON: Just doesn't resonate.

MR. McCORMICK: It doesn't -- we don't add value to, because we -- ultimately it's not controlled at the federal level anyway.

CHAIR WILKERSON: Yes. We understand.

MR. SCHROMSKY: So, one of the things I was reading, NHTSA just was adopting or requiring electric vehicles to --

CHAIR WILKERSON: Yes, it's a cultural.

MR. SCHROMSKY: So, I don't know if legislation -- or a successful legislation where something has been passed has been able to generate -- I don't want to say "intended," but certain results that can be looked upon where, you know, funding --

CHAIR WILKERSON: That's an interesting --

MR. SCHROMSKY: -- or the law that's going to mandate we need to do -- or to do something or not do something.

I thought it was just interesting.

CHAIR WILKERSON: That's a good point.

MR. McCORMICK: I guess I would like to ask John to weigh in on that from an OEM perspective, given that's what

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they deal with, in terms of how you see it going forward.

MR. CAPP: What do you mean going forward?

MR. McCORMICK: In terms of addressing the issue of traffic safety culture in terms of -- from an OEM perspective.

MR. CAPP: Well, you know, it is -- okay. That is an interesting question.

So, you know, a lot has changed on that, I would say, in the last couple of years. I mean, the current NHTSA leadership has had a lot of influence on the safety culture from an OEM standpoint.

There's been a lot of emphasis on what's been called a proactive safety culture. Most of the OEMs signed on to an agreement with the NHTSA administrator about this time last year, maybe, or around the auto show maybe in January, committing to doing more proactive things whether it's, you know, finding -- sharing data of problems in the field, responding to defects sooner.

You know, we've completely reorganized half the company around responding to the defects sooner from our incident a couple and a half years ago. So, that's been a big part.

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And this administrator, at least he's focused a lot on voluntary and, you know, collaborative types of approaches versus waiting for rulemaking or counting on legislation and things like that, because those are unpredictable paths, get different people and they change, the priorities all of a sudden the rug gets pulled out from underneath. You can't really count on it.

So, one change that I've seen recently -- we'll have to see what the coming years are like -- is kind of appealing to at least the auto industry more to act, you know, as a group and proactively do things for safety.

We, you know, we signed on last March, this agreement that we're going to make automatic emergency braking standard on all of our cars by 2022.

MR. McCORMICK: Right. And that came entirely from the automakers. That wasn't requested, was it?

MR. CAPP: Well, it was -- actually the NHTSA administrator came to us, you know. That's a technology that's starting to show benefits in the field -- well, you need to have benefits with this, right?

MR. McCORMICK: Right.

MR. CAPP: Starting to have benefits in the field

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and, you know, so then they were faced with the question of, all right, do you try to do rulemaking and, unfortunately, rulemaking takes a long time -- or do you kind of appeal -- again, this proactive culture -- do you appeal to the OEMs, "Hey, do we all agree we're seeing some benefits?" And they'll say, "Yes."

Starting to get market penetration in, you know, different segments of vehicles now. Some segments it's 10 percent or 20 percent, making it standard.

So, we added -- I was our person working -- negotiating on our side -- a series of meetings here at D.C. with the other OEMs kind of like this and NHTSA, and the Insurance Institute for Highway Safety was also part of it and, you know, basically banged out an agreement that says we'll make that technology standard in that time frame using some existing test procedures, not trying to invent something new, so that everybody could agree to it.

So, I think that's an example of the current culture, but you got to think about it from the regulatory standpoint, too.

NHTSA just -- in fact, a lawsuit was just filed in the last week or so by some of the advocate groups saying

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-- on this exact agreement, you know -- how could you guys let that happen? How could you let a voluntary agreement happen? You're not doing your job as regulators. You didn't raise the bar high enough. You should have required more. Should have required sooner.

So, you know, sometimes there's a no-win situation, but culturally I think the -- all the automakers, I think, are liking the approach of doing things kind of voluntarily. And if we see evidence and see safety data, let's do it.

Consumers are a lot more tuned in to safety, to your point earlier, Scott, than they were in the past. So, you know, they expect that their cars are safe and that companies are doing things to make them safer.

They're expecting all the rest of us, too, our cities and things to be doing things. I think people are paying a lot more attention to safety than they used to.

CHAIR WILKERSON: Any other comments on that?

DR. SHAHEEN: So, I just had a couple of observations. So, I'm on the Subcommittee on Technology and Active Transportation and I think there's a lot of --

MS. QUIGLEY: Crossover.

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DR. SHAHEEN: -- crossover.

MS. QUIGLEY: Oh, yes. Totally.

DR. SHAHEEN: So, maybe we can collaborate a little bit --

MS. QUIGLEY: Yes.

DR. SHAHEEN: -- on that.

MS. QUIGLEY: Can you merge, do you think?

DR. SHAHEEN: I'm not sure.

MS. QUIGLEY: Okay.

DR. SHAHEEN: I defer to Sheryl who's in charge of -- on structure, but I --

MS. QUIGLEY: Maybe not. Maybe not.

PARTICIPANT: Interesting some of the same members are on both committees.

DR. SHAHEEN: Yes. I noticed that as well.

MS. QUIGLEY: Oh, I'm on your subcommittee, too. Sorry.

(Laughter.)

DR. SHAHEEN: So, I think that that's where we get -- we could get at some of your questions regarding --

MS. QUIGLEY: Okay.

DR. SHAHEEN: -- the relationship to ITS. And

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then one of the things that I was showing Tina earlier is a group that I do a little bit of work with, the National Association of City Transportation Officials, released an urban street design guide. And they've been focusing a lot on best practices and different context for approaches that could be used to reduce these fatalities.

And there's all these co-benefits, right? Travel times, increase multi-modality, more active transport. So, I'd like to recommend that maybe we reach out to Linda Bailey at NACTO as a possible speaker and there could be overlap between these two subcommittees.

CHAIR WILKERSON: That reminds me, too, from the --

MR. KISSINGER: One of the -- I mean, in all the discussions that I've been involved in on the subject is with the idea of innovation, not doing same old-same old, not just necessarily making a greater effort, but to look at things very differently, apply different things.

MS. QUIGLEY: Yes.

MR. KISSINGER: And this is somewhat anecdotal, but one of my favorite examples is an experiment that they've been using in some cities in Europe dealing with speed.

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Which in this country, again, is, you know, consistently kills about 30 percent of our, you know, percent of our crashes.

And what they've done is that they set up speed cameras in intersections, but they've implemented them a little differently than we do in this country. And what happens is if you go through the speed camera above the posted speed limit, it takes a picture of you and you're fined. If you go through and obey the speed limit, it takes a picture of you and then your name is put into a lottery bin.

MS. QUIGLEY: Oh.

MR. KISSINGER: And every month or every couple months, what they do is they go in the bin for all the people that have obeyed the speed limit, and they give them --

MS. QUIGLEY: Oh, how fun.

MR. KISSINGER: -- the money from the tickets.

MS. QUIGLEY: That's actually a great idea.

MR. KISSINGER: And it's --

DR. SHAHEEN: It's nudging, right?

MS. QUIGLEY: Yes, nudging. Yes.

MR. KISSINGER: Well, and the reason I, you know, the anecdotal nature of that is that that's part of what the

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culture movement with respect to safety is supposed to be all about.

It's very, very difficult to, quote, "change culture" per se. We start whittling away in terms of looking at things differently.

Another example is -- which, again, Steve's people have really pioneered, is normative approaches towards communication and outreach which consistently in the traffic safety field we haven't used very frequently.

MS. QUIGLEY: What do you mean?

MR. KISSINGER: Well, for example -- the classic example is cited in one of those -- one of the national parks out west, a petrified park or something like that.

And for years they had problems with tourists carrying the Petrified Forest out of the national park, a rock or whatever.

And so, they used to have these big signs, traditional enforcement, if you take one of these things home, you're going to be punished per the --

MS. QUIGLEY: Right.

MR. KISSINGER: -- whatever and it never worked.

MS. QUIGLEY: Right. Right.

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MR. KISSINGER: The rocks continued to disappear and then they went to a normative approach which basically said, do you realize that 99 percent of the people that come to the national park do not -- you know, respect the national park and do not take any of the rocks. And it stopped.

MS. QUIGLEY: Oh, interesting.

MR. KISSINGER: In many, many fields, that normative approach -- and just like in the safety arena, for example, the other example that's often cited is freshmen in college.

And what they -- what they found is that when freshmen show up in college, oftentimes they assume that the -- sort of the culture is to go out and get drunk and, you know, have big parties and whatever.

And it turns out if you -- if they actually survey the incoming freshmen and determine exactly what the culture is or what the actual behavior is, it isn't necessarily like that.

MS. QUIGLEY: Oh, so they promote the normative.

MR. KISSINGER: And then they feed that back to the --

MS. QUIGLEY: Oh, interesting.

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MR. KISSINGER: Then that information is fed back to the students --

MS. QUIGLEY: Right.

MR. KISSINGER: -- and has an impact on their culture and an impact on their behavior.

MS. QUIGLEY: See, that is --

MR. KISSINGER: So, there's a lot, you know --

MS. QUIGLEY: So, this number one bullet point here, "Exploring behavior and psychology issues," really sounds like something that we should at least have some case studies.

MR. KISSINGER: Yes. And I would just say --

MS. QUIGLEY: Yes.

MR. KISSINGER: -- you know, I mean, this is an extremely complex and broad topic.

MS. QUIGLEY: Yes.

MR. KISSINGER: We should focus on how it relates to --

MS. QUIGLEY: Yes.

MR. KISSINGER: -- you know, the work of Ken and --

MS. QUIGLEY: Right.

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PARTICIPANT: Can I make a suggestion?

CHAIR WILKERSON: Steve was next. Go ahead.

MR. ALBERT: The idea of how you change people's attitudes and the messaging is critical, I think, to ITS.

I know what we -- what Peter has mentioned, we've done a lot of this in states and basically it's taking -- taking the message and turning it on its head.

Instead of emphasizing the negative, you emphasize the positive that then it gets implemented earlier.

And you think of some of the ITS stuff over the years, it hasn't been implemented because of leadership like red light running or the use of dynamic message signs, whatever it might be.

Maybe one of the things the committee should be looking at is the application of messaging to utilization of ITS or connected vehicles or other elements that might be --

MS. QUIGLEY: Yes.

MR. ALBERT: Because messaging makes something far more effective --

MS. QUIGLEY: Yes.

MR. ALBERT: -- than just taking a big mallet and hitting someone on the head.

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MS. QUIGLEY: Messaging is -- messaging gives courage, I think, to elected officials. Messaging helps overcome, you know -- even state legislatures --

MR. ALBERT: Right.

MS. QUIGLEY: -- who have certain philosophies, personal ideas, messaging helps --

MR. ALBERT: I know we've done a lot of this making institutional changes in Idaho. It's really becoming kind of a leader with messaging and other things that I'd be glad to provide if anyone needs it.

MS. QUIGLEY: That's great.

MR. ALBERT: But I think that may be even an overlaying layer to much of what we do, really, I think, in this committee, is the messaging side of things.

MR. McCORMICK: Steve McCormick.

I think that's -- I'm seeing a path here that I think has value. When we talk about the recommendations the committee makes, having a recommendation that's looking at what the behavioral motivators are that address issues, whether that's awareness, intention, appreciation of, all of those best examples, putting together a case of here's a number of best examples in Europe, in Idaho, in wherever,

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where we've seen an effective reduction in injury or crashes.

And that leads to the recommendation that they explore further those behavioral modifiers and work on, as you said -- I love that comment that said, you know, messaging is empowering to the politicians, because it gives them something that they know will resonate with the people.

MS. QUIGLEY: Especially if we use that normative.

MR. McCORMICK: Yes.

MS. QUIGLEY: Let's just talk about the normative behavior. Hey, guys, 99.9 percent of other communities are doing this. Oh, okay. Now, I got to think about this.

MR. SCHROMSKY: So, when you look at the economic piece, obviously I think what you're pointing at I think, is this number. Do you also look at how do you make it more real? Are there any city workers or personnel --

MS. QUIGLEY: Right.

MR. SCHROMSKY: -- that have been affected by this, because that's real budget, that's real healthcare costs that are coming out of your budget, your city, your --

MS. QUIGLEY: I was thinking that when somebody said --

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MR. SCHROMSKY: You know, so, hey, this is what I want from the industry, you know, if they had 120, to realize two of that 120, whatever they need to be anywhere, were the ones affected that generate this amount of cost to our city budget.

So, you know, just imagine how many businesses in the community that would be affected and they're, you know, how do you --

MS. QUIGLEY: Right.

MR. SCHROMSKY: -- put a dollar amount on it, right, to make it more real?

MS. QUIGLEY: You need dollars and you need stories, yes. You need to --

MR. SCHROMSKY: I would say you start bringing the insurance company in. I think we had TransUnion kind of presented I think the two ITSA Meetings before and I think -- what I think was interesting for them is being an insurance company, they're putting in certain controls for distracted drivers.

Why? It's in their best interest for lowering their policy claims.

PARTICIPANT: TransUnion is not an insurance

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company.

MR. SCHROMSKY: Well, I mean yes, but it's in their best interest for lowering their policy claims to actually do that. So, they're proactive in making that happen to reduce claims and risk on their part.

MS. QUIGLEY: Uh-huh.

MR. SCHROMSKY: So, you keep going back to the economic model.

MS. QUIGLEY: Right.

MR. SCHROMSKY: You want to make it more, you know, hey, a bunch of tourists get hit back home, that's not my problem anymore. Where if it's my personnel, how many of my citizens and not tourists --

MS. QUIGLEY: Right.

MR. SCHROMSKY: -- I think it becomes more real especially if the individuals are hit, don't have healthcare, you look at trading other resources from the city or county, it starts to add up and it makes it for a real conundrum.

MS. QUIGLEY: Right.

CHAIR WILKERSON: Raj.

PROFESSOR RAJKUMAR: Raj Rajkumar.

We have a national University Transportation

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Center at the Carnegie Mellon University focusing exclusively on safety.

We had an annual safety summit in 2015 in Pittsburgh, where we are located, and one in D.C. this past March, bringing together the government from the various UTCs looking at safety projects and also community groups as well. So, we have been collecting a lot of information on this particular resource of safety.

So to me, it's kind of an interplay of cross-multidimensional technology, of course ITS, culture, policy and investments. So, just want to identify a couple of things.

Some of these are forward-looking, but some of them are on the ground right now. We've been looking at some infrastructure and so on to smooth traffic using some elevated fencing and so on.

This has been deployed across 50 traffic lights right now in Pittsburgh. Lots of data about how exactly improving delays and throughput, how exactly improving air quality, for example.

Meanwhile, a concern has been about are we prioritizing bicyclists and pedestrians from a safety

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perspective? And to that, we can persist right now happening as we speak.

And meanwhile down south at the US DOT Smart City Challenge and the follow-up program, the primary award went to Columbus, the secondary award for \$11 million went for the City of Pittsburgh, basically trying to extend this technology across a hundred or so traffic lights, fifty or a hundred, or so.

So, right now we wish to say that, hey, how can we track the time it takes for pedestrians to jaywalk. So, there is some of our data collected on this one more. So, that's one aspect that happens on the ground right now.

And meanwhile, we have deployed technologies to count the number of pedestrians and bicyclists waiting at this intersection that is idea that when you are waiting to go to a traffic light, the traffic light changes so that you get a green light.

But if you're a pedestrian, you have to basically press a button. Cars don't have to, but you have to press a button. So, we are creating, as a culture, pedestrians and bicyclists that don't have to wait.

So, the question is, can we instruct them to press

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a button, can you automatically sense the presence of pedestrians and bicyclists and turn the color of traffic light? So, you are looking at communicative technology, if you will.

Meanwhile, within the vehicle we are looking at various technologies to basically say, can we monitor distraction within the vehicle?

We are looking at basically the availability of using a smartphone, you want to be a hands-free form, you can actually analyze the voice if you want and actually sense stress and anxiety. Yelling and so on, that could actually basically feed that back and say, hey, slow down, something is going on and we be able to disconnect the phone.

We are looking at, for example, visual technology to basically monitor the human driver's visual frame and see if you are paying attention to the road. So, that's the second component.

Our third component is basically embedding sensors inside of seats basically saying, hey, are they leaning this way or the other way and, therefore, they are not sitting straight in the vehicle.

So wonderful technology can be brought to bear,

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but distraction is a serious problem within the vehicle. So, that's complementary technology.

Meanwhile, working with the community side of things, we are working with organizations like Bike Pittsburgh, where they extremely serious about safety for bicyclists.

It helps significantly that members of our management team are bicyclists themselves. So, they're very passionate about --

MS. QUIGLEY: See. Leadership, yes.

PROFESSOR RAJKUMAR: So, I think they're looking to also identify specific locations for where pedestrian accidents and crashes are predominant so you can basically focus on specific things, as opposed to the concrete bigger picture of all the connections.

CHAIR WILKERSON: Okay.

PROFESSOR RAJKUMAR: So, we think -- so just to add a couple more points, we are also looking at connectivity technologies that will lead to extra, you know, you highlighted some of that. So, I think we can play a key role. And smartphones actually can be an enabler of this as well, now to get an update from the US DOT on what's happening or

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not happening with the FCC spectrum allocation decision.

And meanwhile, Bryan, you pointed out how the insurance industry could get involved. Insurance, basically, of course, has an incentive to basically make sure that fatalities and crashes go down. So I think that we need to bring them in as well, and then there's a lot of data that they have that, I think, could be very useful.

And last, but not the least, automation, which I guess we have a few questions and so on, should basically be increasing the important role to basically reduce distraction, improve that.

I guess the incoming administration -- the last administration proposed a \$4 billion investment, which of course runs over for 10 years, and basically we can see these start with the new administration policies to basically improve investments.

But I think the point I wanted to make is that I don't think we need substantial change to investments. Technology is progressing rapidly, like the \$14 million Smart City award to Columbus, \$11 million dollars to Pittsburgh for technology condition management and so on.

I think strategic investments in these key areas

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could make a difference. We see the early-on indicators of that, but I think it's nice to do more.

CHAIR WILKERSON: Okay.

PROFESSOR RAJKUMAR: So that's what I wanted to share.

CHAIR WILKERSON: We've had some more guests join. So, I think it would be helpful for the panel to know who's here.

For those of you who haven't introduced yourself already, if you could stand up and introduce yourself and this would be a great opportunity -- we have about 23 more minutes left in the discussion on traffic safety culture.

If you have a particular question that you would like to ask or a topic or a subtopic you would like for the members here to entertain, please feel free to throw that out.

MS. HOPPER: Where do you want to start?

CHAIR WILKERSON: Either end.

MS. HOPPER: Okay. I'm Regina Hopper. I'm CEO of ITS America, and thank you. I wanted to just come in today because I had not had a chance since getting there to see one of your meetings and to listen to your discussions.

So, happy to ask questions --

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CHAIR WILKERSON: Thanks, Regina.

MS. HOPPER: -- at some point. Right now, no, but thank you for letting me observe and to learn a little bit about what you all are doing. Thank you.

MR. REAGAN: Hello. My name is Ian Reagan. I'm a senior research scientist with the Insurance Institute for Highway Safety.

CHAIR WILKERSON: Okay. They are here then.

MR. McCORMICK: Sheryl, you've got a couple on this side.

CHAIR WILKERSON: Okay. I'm sorry. Pardon me.

MR. THANIEL: Yes. Good morning. Ron Thaniel, vice president of legislative affairs with ITS America.

MR. BAYLESS: Steven Bayless, also VP, regulatory affairs, ITS America.

MS. QUIGLEY: Steve, good to see you again.

CHAIR WILKERSON: Any comments, questions, thoughts? Anything else you guys want us to address?

Okay. Go right ahead.

MR. SMITH: Yes, I just wanted to chime in and follow up on what Raj was discussing that -- with the efforts that we are putting forward at US DOT.

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He mentioned the Pittsburgh \$11 million. That's part of a bigger package of -- well, around \$60 million annually for the next five years looking at -- looking at condition management really trying to tie in technology into how transportation can move better.

CHAIR WILKERSON: Uh-huh.

MR. SMITH: Kind of what we're discussing here today, and the responses as well.

The one thing I wanted to mention is on the safety discussion, how do we tie in the evaluation piece of it? Because a big part of what we're trying to get out of these efforts is that evaluation segment, so that we can actually explain to them --

MS. QUIGLEY: Yes.

MR. SMITH: -- you know, if you put this strategy/idea out there, this is sort of what it's going to generate.

MS. QUIGLEY: Again, the economics of it, right?

MR. SMITH: Exactly.

MS. QUIGLEY: So, being able to --

MR. SMITH: Yes. So, you actually have information that you can actually speak directly to

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management and the decision-makers and inform them about how there's these strategies, this technology is really going to influence the actual outcomes --

MS. QUIGLEY: Right.

MR. SMITH: -- so they can actually go out and feel confident in promoting these ideas and promoting these so that they get reelected, basically.

MS. QUIGLEY: Yes.

MR. SMITH: Yes.

MS. QUIGLEY: No, it's true.

MR. SMITH: That's kind of what's necessary.

MR. SCHROMSKY: What you're asking for is what's the desired results, right?

MR. SMITH: Right.

MR. SCHROMSKY: So, if I do this, what -- is it going to reduce deaths by 20 percent?

MS. QUIGLEY: Right.

MR. SCHROMSKY: So, how do you put results around gauging culture?

MS. QUIGLEY: Right.

DR. SHAHEEN: Right.

MR. SCHROMSKY: Right. I mean, I think that's a

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problem, right? So, there's some, you know, if I put in common laws, I can probably see a reduction, whatever it may be, but it's really what's the tangible results that when you look at culture, an ad campaign, the seat belt campaign --

MR. McCORMICK: Well, yes, but I think --

(Simultaneous speaking.)

MR. SCHROMSKY: Here's what I, you know, some intended, some unintended, right? And say, hey, this was the goal, we've exceeded or not exceeded ---

MS. QUIGLEY: Right.

MR. SCHROMSKY: -- but we also saw growth in this other area which we didn't anticipate.

MR. KISSINGER: Well, we have -- I mean, we have long lists of known counter-measures on the engineering side, on the behavioral side that, you know, have been evaluated sufficiently so that we know if we do this, we're going to get this result.

MS. QUIGLEY: Uh-huh.

MR. KISSINGER: And I would argue that the bigger problem is not identifying that, it's implementing those kinds of measures. And part of that is the culture of just support for it, and part of it is, quite frankly, the money,

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I mean, allocating the resources.

I mean, we -- our socioeconomic cost of traffic accidents in this country is about three percent of the GDP. And I would certainly argue we're not spending anywhere close to three percent of the GDP on research and --

MS. QUIGLEY: Huh-uh. See, now that's a great message right there. You're right. So, you don't - the Feds give us X millions of dollars every year to invest in new asphalt.

I don't know. Maybe that money would be more appropriate if you forced me instead to invest in technology or in safety, you know, related technology efforts. I might see a bigger bang for --

MR. KISSINGER: And I also would absolutely, 1,000 percent, you know, agree with this kind of evaluation because that's one of my pet peeves in my old professional career is that we spend a lot of time identifying a problem, implementing solutions and we oftentimes forget about whether to evaluate and see if it actually works.

MS. QUIGLEY: Yes.

MR. KISSINGER: I would argue you can just go in D.C. and look at a lot of bike counter-measures supposedly

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implemented throughout the city, and most of those have never been evaluated and are not being evaluated right now.

CHAIR WILKERSON: Okay.

Did you have a comment?

MR. LEONARD: No, just that -- it's to the point that Peter made. So, it goes beyond just the economics of it.

It really gets to are we gathering the metrics in conducting the evaluation to make sure we have the data to be making the decisions?

Sometimes that's economic data, but sometimes it's measuring other aspects, adoption rates and things like that, to make sure we can be effective in putting solutions out there.

And it is a challenge, because you have to implement, you have to prototype, you have to measure and you have to digest all that and understand whether what you've done is actually what has caused the change, if you've seen a change, or if it's improved the situation even if you haven't seen the change.

Because when you've got -- like right now we've got climbing fatality rates. Right now my goal would be to

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make sure that we don't see a climb in the fatality rates next year. Then, my goal would be to see if we could get a reduction again.

So, you know, if you -- if we can take steps to just stop the wrong trend, but how do you measure that if you don't see a change?

DR. SHAHEEN: Right.

MR. LEONARD: It's hard to know whether you're being effective in some --

DR. SHAHEEN: You bring up a good point. Right.

So, I just wanted to chime in on the evaluation piece as well. I think it's -- we can't underscore enough how important it is for us to do these kinds of before-and-after analyses to really understand what the mechanisms are and to get a handle on things like human factors.

And similar to Pittsburgh, San Francisco did not win the Smart City Challenge, but we did win a Congestion Management Award. So, thank you.

And I'm leading the evaluation for Berkeley and we have a Vision Zero corridor. San Francisco suffers, as Debra mentioned, from tremendous pedestrian fatalities.

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It's unbelievable.

And so, Mayor Lee and San Francisco, I've had the pleasure of working really closely with him on our initiative, wants to do something about this desperately.

So, I think one of the things we're going to be doing with our approach, it's also a corridor, we're going to be really honing in on the intersections that we found to be problematic and really try to look at technology solutions, but how human behavior interfaces with that. So, let's hear it for more evaluation.

(Laughter.)

CHAIR WILKERSON: That's great. That's a good theme. Agree.

MR. STEUDLE: So, having been on four of these committees, I've heard this discussion before. So, I went back to our recommendations.

In 2014, we had a recommendation to engage the communications professionals to talk about messaging.

DR. SHAHEEN: Uh-huh.

MR. STEUDLE: And while that was broadly about messaging, the response from JPO was the Department concurs and is acting accordingly within the bounds of its

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legislative mandate.

That's the important part, because this conversation is interesting, but does it fit in the legislative mandate of JPO.

DR. SHAHEEN: Uh-huh.

MR. STEUDLE: It fits within US DOT, but does it fit within JPO? So, we can have this conversation that if it doesn't fit, we're going to get a nice response that says, ultimately consumer awareness of the benefits of connected vehicle use by and large --

(Off record comments.)

CHAIR WILKERSON: Can you also, just for the benefit -- everybody has the summary, which recommendation and summary are you --

MR. STEUDLE: It's Recommendation No. 14.

CHAIR WILKERSON: Okay.

MR. STEUDLE: 2014.

CHAIR WILKERSON: Okay. So, that's --

MR. STEUDLE: So, while we -- I mean, I've been DOT director for 11 years. We've got a Vision Zero safety program, too. I agree with all the discussion. But if it's not relevant when we're going to get to the end, we're just

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going to have wasted an hour for JPO to say, "That's nice, but we can't go outside our legislative mandate."

So, is it outside their legislative mandate, or not?

(Laughter.)

MR. STEUDLE: I'm just trying to use our time appropriately.

MR. LEONARD: So, I have heard --

MR. STEUDLE: We can talk and we can give recommendation, but this response is --

MR. LEONARD: I have heard some discussion here that is outside the bounds of what the JPO does.

I have heard discussion that's inside the bounds of what we do, you know, particularly -- I mean, we've heard about two programs we're actually funding, the congestion grants that are part of the Smart City activity.

We have a lot -- we have work ongoing in evaluation. We have work -- a lot of work ongoing in vehicle-to-pedestrian and we're actually doing some testing on that, because that is part of the traffic safety culture piece that we think ITS systems can impact.

You know, for example, some of the things, John,

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you were talking about, it's not really an ITS issue. I'm glad -- I mean, I'm glad to see voluntary adoption, despite the fact that some people want to see regulation.

I'm glad to see the voluntary adoption, because I think it means we'll start to get some of the technology out there quicker rather than if we got in an adversarial role.

What's relevant to the ITS JPO and to some of the work that we're doing, you know, as we talk about, well, where are we going on DSRC and spectrum issues like that, is voluntary adoption a mechanism if we don't see a rule out of this administration and, you know, is that an avenue? So, it's tangentially related.

MR. CAPP: That was my -- kind of my point in using that as an example of kind of a change in culture towards more of a voluntary approach that can work.

MR. LEONARD: Now, in terms of our, you know, specifically to the point you raised, Kirk, around messaging, I think we have increased our messaging. We have contracted out with firms that help us with some of that messaging.

We haven't gone to kind of like a PR firm. I'm not sure that fits within what we could really do within the

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JPO, but I would ask people look back at what they've seen the Secretary talking about in the last two years; connected vehicles, automated vehicles, Smart Cities.

I think we've got one of the best messengers out there carrying our message on a lot of topics that we're working on.

So, have we fully addressed that? Maybe not. Have we gotten a lot more visibility for the portfolio? I think we have. I really think that Smart Cities -- and my apologies to those who competed and did not win, there were 78 -- I think we have really captured worldwide imagination around that and I've been telling people I think that is the future of ITS.

And everything we've been working on starts to fit into that larger context of Smart Cities.

Some of what I've heard here I think we're going to be able to act on, and some of what I've heard here we'll not be able to.

MR. STEUDLE: Well, my point for raising it was for those folks that -- around the table that are very passionate about it, because I've heard things that I think are out of bounds as well. Don't be dissatisfied when it

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comes back and you didn't --

PARTICIPANT: No, I think that's right.

MR. STEUDLE: -- hear what you thought you were going to hear.

MR. BELCHER: But, Kirk, don't -- let me just ask, you know, let me play the devil's advocate.

I mean, in the sense that we raise it, it has to go to the Secretary, it has to go to the front office, they have to review it. So, it's elevated there, it goes to Congress.

I mean, so even if it's outside of the bounds, it's getting exposure it wouldn't otherwise get.

I mean, I've been on this as long as you have been. And so, I've heard the conversation every time, but I do think it has moved the needle a little bit.

MR. STEUDLE: Well, I mean, we do have the Secretary that embraced it and talked a lot about it. You're exactly right. And none until him have.

CHAIR WILKERSON: But I think you raise a good point.

MR. STEUDLE: But I don't think it was because we sent a letter to him.

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MR. McCORMICK: However, that term ends shortly.

CHAIR WILKERSON: I was just going to say I think you raise a really great point, but it's something that as the subcommittee evolves, it can add to the caveat and reevaluate whether we are in line as we move forward. So, I think that's a very valid comment.

MR. WEBB: I'd like -- just like to bring it back almost to the beginning of what you started with. And that was, who's doing what in this arena around the country?

And that's one thing that I search for is a clearinghouse of some kind -- you know, Raj, you were giving examples as far as what is happening here and you're getting things -- I would love to know what communities are trying what things, and what they believe are successful or not or whether -- but even just that they're trying.

CHAIR WILKERSON: Right. And then doing some evaluation so as --

MR. WEBB: So that I could contact them and give them more information or something like that, but I don't think there's one clearinghouse or one location that I can go to, to get that information that people say, "Yes, I'm trying to do that."

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So, is that something potentially that we should be asking for that maybe JPO could --

DR. SHAHEEN: Well, I think outreach to NACTO is really a great idea, because that's the cities and they -- and they're sharing a lot of these best practices.

And maybe they're not catching everything, but I think there's a lot of knowledge that we could interface with them, hear a presentation and learn a great deal.

MR. WEBB: Yes. And understand the difference. Susan mentioned cities. I'm a county and we don't necessarily talk, you know, but we are our own different local governments and so forth like that.

I don't have a large central city in my county, and so -- yes. So, we know NACTO is out there and so forth as far as our national organizations as well, but that exchange of information, I think, could be key.

MR. McCORMICK: We have a good model for that in the affiliated test bed. And possibly it's the AASHTO-funded center of excellence would be a place where they could harvest city and county and federal examples.

MR. ALBERT: Can I give you two examples of -- this exists. One -- the other hat that I wear is the head

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of the FHWA's National Rural Center for Traffic Safety and we have a clearing house that includes messaging.

There is also another one that we're running on a FHWA pooled fund study just focused on traffic safety culture. And they have messages in that.

I could send out the links to those if you want them.

CHAIR WILKERSON: That would be great.

MR. ALBERT: But that information exists already.

CHAIR WILKERSON: Great. So, we have about -- it's 9:48 I have right now. So, we have about 10 minutes or so to wrap up.

There are some great themes. I don't know if you've all been taking notes, but leadership, urban/rural economic normative approaches, evaluations, the business case. Let's see. Evaluating a before-and-after tangible results.

Those are some common themes. So, maybe it might be great for you all to -- the team -- the subcommittee to maybe wrap up while we are -- before our next committee call and then maybe share some of those.

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We also had some great ideas for speakers which we could include on one of our -- one or two of -- our call or the next meeting. So, there are a couple of names that you've raised and others that we have on the list. So, Linda Bailey and others.

So, and then I don't know if we have others, but you might want to close out, use the next 10 minutes to talk about how you'd like to move forward and what --

MS. QUIGLEY: Well, I like getting together, having a conversation. I'd like to work with the Technology and Active Transportation Committee as well, because there's a lot of crossover there in the conversations.

And then let's -- the subcommittee does need to discern, as Kirk said, what's appropriate for our direction to JPO, but I want to emphasize something that you said just kind of casually that I thought was really important.

You said that certainly fatalities are increasing and it would be your responsibility to figure out how we stop them from increasing. And I do think that that's a very appropriate ask, because inevitably they're increasing probably due to distracted driver and distracted pedestrian.

So, using, I think, ITS is definitely a tool that

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helps with that.

CHAIR WILKERSON: And that was directed to Ken, just for the record.

MS. QUIGLEY: Oh, sorry.

CHAIR WILKERSON: That's okay.

MS. QUIGLEY: Sorry, Ken.

MR. LEONARD: And one thing I would just point out, we -- the fatality rates -- a big part of fatality increase that I have seen, I think, between bicyclists, pedestrian and motorcyclists, they're each up in the high single to double digits. So, nine to 12 percent between those categories. I can't remember each of them, but it's a lot of fatalities.

MS. QUIGLEY: We're up 30 percent.

MR. LEONARD: And, again, I mean, I know Florida has some high rates and -- I guess the point I would add is that we are -- we are putting resources into the V2P piece.

And you mentioned intersections. We're also -- we've got a group of folks who are very interested in that. So, you know, with our connected vehicle pilot in Tampa, we're doing some pedestrian work.

New York. The corridor where we're putting

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equipment in, in New York, has 10 times, you know, the fatality rate of other parts of the country. It's astronomical. It's downtown Manhattan. You've got a lot of vehicles and people.

But we also have -- at least three of the congestion grants are focused on pedestrian, as well as some of the work we're doing in Columbus -- Smart City.

In addition to that, we're also funding some work and we had a lot of internal debate inside Federal Highways on some of our vehicle-to-pedestrian laboratory work, because we had some interest in some work that we had not funded previously and we wanted to restructure that, because sometimes when you don't do a body of research in a given period of time, it becomes overcome by events.

And so, what we've done is we took all the work that we're now planning in vehicle-to-pedestrian work, and updated our plan for laboratory analysis on that so that it would be relevant to what we're learning out of our pilot programs.

And so, again, some of this research, it takes time. And we've got fatality rates climbing now. I wish I could turn around and say we'll have an answer this year, but,

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in fact, we'll just be deploying equipment and testing out new approaches this year and next year.

MS. QUIGLEY: Well, what could the subcommittee do to help you, then, in advancing the existing efforts you've already got going on?

MR. LEONARD: That's a good question.

MS. QUIGLEY: Well, you don't have to answer that right away, but so that we're not reinventing the wheel and we're not spending a lot of time and energy on stuff that won't -- I'd rather -- it sounds like you've got some great work going on. I'd rather use our energy to help you leverage existing efforts you've got moving forward.

MR. LEONARD: Well, that -- one of the things we also want to do is leverage efforts that we may not be aware of, you know, because --

MR. BELCHER: So, on that note, Ken, and for the committee, I mean, one thing that's coming up is there's a next generation wireless initiative that is being funded by National Science Foundation and it will put \$300 million into four cities. It's modeled after the Smart Cities program and it's to look at next generation wireless technology.

Clearly, this fits squarely there --

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MS. QUIGLEY: Yes, it does.

MR. BELCHER: -- and so it, you know, if we can help DOT be part of the dialog -- and for the academics, they're going to pick the cities based on a research university that can be there and the cities will become real test beds.

So, it's not just going to be -- it is -- it's focused on wireless, but obviously it's infrastructure, obviously it's safety, it's -- so, I think there's a real opportunity there.

And that money will obviously grow, because it will have the private sector match or the private sector contribution in the same way that the Smart Cities' grant did.

MS. QUIGLEY: Great.

MR. LEONARD: And, you know, another example I offer was I was down at the University of Alabama maybe three weeks ago and found out that their university president is very interested in equipping 500 student cell phones with vehicle-to-pedestrian devices.

So, it's that kind of --

MS. QUIGLEY: Cool.

MR. LEONARD: -- we can't possibly know all of the

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things that everybody is --

MS. QUIGLEY: Everybody, uh-huh.

MR. LEONARD: And I get that sometimes where people come up to me and say, "Well, did you hear about this project in Cleveland or someplace?" And it's like, "No, I didn't." And, you know, because there's so much going on.

MS. QUIGLEY: Right.

MR. LEONARD: But I do appreciate when people bring to our attention things that are happening at the local level, because, I mean, that's where we can get data from.

MR. McCORMICK: Well, I think that needs to be a formalized process. I know you appreciate when you get it, but that's kind of an ad hoc way of collecting best practice and information.

I think there needs to be some -- I don't know how you would incentivize it, but something like the affiliated test bed where you can have people have a place for them to highlight what they do.

MR. LEONARD: And one of the things we do is every two years we actually do a survey of ITS deployments in 75 to 80 major areas. But, still, that's every two years and sometimes something can be fairly well underway and it's not

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a comprehensive national survey and we don't get full responses to it.

So, we do have some systematic approaches to try and gather that information, but I dare say I'm sure we are -- I'm sure there are things going on in ITS that we're not aware of.

CHAIR WILKERSON: That could possibly tie into the evaluation.

MR. McCORMICK: And where is that, the 500-student test?

MR. LEONARD: Tuscaloosa.

CHAIR WILKERSON: Kirk.

MR. STEUDLE: So, to follow on what could be -- just thinking of Scott's issue, what could be helpful is if you had a portal of the things that you are doing that says, "Here's the latest update," instead of every two years. What's going on every three months?

What are you learning so that people aren't relearning? That's -- because I see that happening a lot.

CHAIR WILKERSON: Or they could share.

MR. STEUDLE: People are relearning things that, frankly, we've already learned five years ago.

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MS. QUIGLEY: Sure.

MR. STEUDLE: And there's people that are now trying to reinvent things that are happening maybe in the three pilots and I think we're wasting, as a country, a lot of resources reinventing the wheel --

CHAIR WILKERSON: That's a good point.

MR. STEUDLE: -- in 50 different states and in a thousand different cities.

MS. QUIGLEY: Gosh, I think you're right.

MR. STEUDLE: So, something that would say, look, here's the latest of the things that you have control over, right? The things that you know. You know what you're learning. You've updated the radio, whatever.

And then there's some portal at the bottom that says, you know, "submit yours" that just kind of links it in. But now people will go there and that becomes a repository.

They look and say, oh, okay, that's the official stuff. Here's the unofficial stuff that's being reported by other people. It's, you know, it then now becomes kind of the open -- it's an open source.

I think you have to be careful as to, you know, what's the quality of the postings, what are people really

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doing or --

MS. QUIGLEY: Yes, fake news.

MR. STEUDLE: -- but I think from that point --

CHAIR WILKERSON: That's right.

MR. STEUDLE: -- we can see people are -- they're sharing information, but they're also -- when somebody comes to them -- and I'll guarantee this is happening somewhere, some consultant is selling somebody on a bill of goods that's five years old today.

CHAIR WILKERSON: Yes.

MR. STEUDLE: Right. And somebody is spending public money on something that is useless and a waste of time.

MS. QUIGLEY: Yes.

MR. STEUDLE: But there's no place to look and say we really shouldn't do that.

CHAIR WILKERSON: That's a good point.

MS. QUIGLEY: Yes. Let's call the website Stop the Waste. Stop the Waste. Stop reinventing the wheel. Something like that.

(Off record comments.)

CHAIR WILKERSON: Raj, we have a few more minutes.

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PROFESSOR RAJKUMAR: So, with regard to the increase in the fatalities last year, it is quite possible that smartphone distraction is a primary source of that problem someone get the smartphone technology providers to be part of a discussion like this and maybe a voluntary agreement that, for example, disable some apps if --

PARTICIPANT: No, that will never happen. That will never, ever happen.

PROFESSOR RAJKUMAR: So, that's a question I guess --

(Laughter.)

PARTICIPANT: You could ask, but I'm going to give you 20 years of history. That will never happen.

PROFESSOR RAJKUMAR: So, that's kind of really depressing, I'd like to give a positive side, there's an entity called the MetroLab Network, which is actually based in D.C., about a year and a half old. It's a consortium of about 40 members. And each member of this party is a partnership between a city/county and a research university facility to come up with ideas and deploy them.

So, there are best practices that we can identify that could be an idea to propagate them. That these members

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are willing adopters. So, I just want to highlight that.

CHAIR WILKERSON: And then I would probably add, too, organizations that have best practices, that they are going to be rolling out their best practice models that we can share with you as well with all the motor vehicle safety administrators.

MS. QUIGLEY: Right.

CHAIR WILKERSON: So, that should be coming out soon.

MR. KISSINGER: One last comment before we break, picking up on a comment earlier about allocation of resources and whatever.

If you go through all these recommendations, which I'm sure Ken has done more than I have, one of the themes is consistently we agree with this or we --

CHAIR WILKERSON: Uh-huh.

MR. KISSINGER: And then it ends with, should funds become available.

(Laughter.)

MR. KISSINGER: And sometimes we're not doing them any favors if we're just throwing everything in the world

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CHAIR WILKERSON: Right. Right.

MR. KISSINGER: But I do think the committee could take a stronger role in helping them prioritize or at least letting them know what we think.

MS. QUIGLEY: Uh-huh.

CHAIR WILKERSON: Yes. I agree with that. That's one of the tasks that I talk about in the very beginning that when we come back --

MS. QUIGLEY: Yes. Agreed.

CHAIR WILKERSON: -- we should take a hard look at that and come up with some concrete thoughts.

Okay. Well, that was a -- thanks for leading that.

MS. QUIGLEY: Yes. Thank you.

CHAIR WILKERSON: Tina, Debra, that was really thoughtful and -- we now have, I think, a 10-minute break -- 15-minute break. Thank you for reminding me. 10:00 to 10:15. So, we'll come back at 10:15 and then we'll start with John.

(Whereupon, the above-entitled matter went off the record at 10:01 a.m. and resumed at 10:17 a.m.)

CHAIR WILKERSON: We're going to get started.

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Thank you. So, we're going to go ahead and get started. Is John -- is everybody here?

Let's see. So, John's here. So, when we last spoke, we -- John and Roger both agreed to lead the Subcommittee on Automation and the Interrelationship between Connected and Automated Vehicles.

And I don't know if you'd like to just sort of jump right in. We have an hour before lunch and --

MR. CAPP: Yes, that's great.

So, we also have not had any formal subcommittee meetings, but Roger and I have had a few conversations. And so, what I thought is we'd share just a little bit of what some of our thoughts were.

Maybe I'll also just talk for a couple of minutes on some of, you know, what OEM's perspective on some things that have changed, you know, in the automated space over the last year that, you know, might influence what we want to focus on here. And then perhaps we can have kind of an open exchange like we just did on the other topic that I thought was good.

So, one of the things that Roger and I thought about as we were talking, was instead of focusing on a gap

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analysis, you know, looking for things to add to the pile kind of where Kirk was going earlier, there's certain -- clearly plenty of work going on within the ITS JPO program.

Maybe what we want to do is take a close look at that work that's going on and see if, you know, see what should change or if the priorities of it are different so that, you know, at least there really are resources to do some of the work and make sure that it's focused on the things that we think are relevant to this area and maybe help Ken and the team with some of the priorities they show, we could add to it or enhance it versus, you know, completely new ideas. Not that that wouldn't be okay, but we thought that might be a constructive way.

So, what we -- we're going to modify the steps on here a little bit. Instead of focusing on a gap analysis, focusing more on going through the strategic plan that exists and some of the work that's ongoing and really take a close look through the lens of connected and automated, you know, linked together and take a look at those projects and prioritization.

So, that's kind of what we thought from a task standpoint from the subcommittee, might yield some new or

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interesting perspectives. So, that's what we're going to plan to do when we get the committee together.

CHAIR WILKERSON: Okay.

MR. CAPP: In fact, Roger and I kind of already took a pass through the -- we pulled up the strategic plan and went through and started making some notes on our own.

You know, one of the things that struck us is that -- I don't know, Ken, what is the cycle for updating that? I mean, it's old, right? It's two years old.

MR. LEONARD: Yes. Well, here's the thing. In the FAST Act, Congress changed our approach to strategic planning. So, they no longer require just from the ITS Joint Program Office issue a strategic plan.

So, the Department is putting in both modal plans and strategic plans, and that's coordinated out of OST-R, Greg Winfree's shop.

So, that -- the modal plans are now going to happen on an annual cycle. So, we -- we're putting the finishing touches on that and it will be published on the website. And that's how we will submit it to Congress.

MR. CAPP: So, does that replace the strategic plan?

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MR. LEONARD: So, there's going -- there's both a five-year strategic plan and the annual modal plans. So, and the --

MR. CAPP: Okay. So, that actually answers my first question then. It's a five-year strategic plan.

MR. LEONARD: And, Egan, I know you've been hip deep in -- this is a Section 6019 issue -- John is asking about the modal plans versus the strategic plans, and I don't remember the specific -- does the FAST Act require an annual update of the five-year strategic plan, or just of the modal plans?

MR. SMITH: There's an annual update to the modal plans, not to the strategic plan. The strategic plan is a five-year plan. So, it's not an annual update.

MR. McCORMICK: I'm sorry, I can barely hear you.

CHAIR WILKERSON: He was just repeating what Ken said.

MR. SMITH: Yes. There's an annual update to the annual modal plan, but not for the strategic plan. I believe it's a five-year plan and it's -- well, going to be targeted for another update in five years, probably.

MR. LEONARD: But when is the five-year plan

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going to be published?

MR. SMITH: Oh. Publish date --

MR. LEONARD: May?

MR. SMITH: No, I think it's earlier than that.

I think it's January, actually.

MR. LEONARD: January?

MR. SMITH: I think it's pretty soon.

PROFESSOR RAJKUMAR: January 17th?

MR. SMITH: Yes, probably around that time.

MR. LEONARD: And then there will be the annual modal plans. So, we've had a slight change.

We used to do an ITS strategic plan every five years, but we did it -- we would do a two-year update.

Now that we're doing an annual modal plan update, we probably will not do the two-year update anymore.

CHAIR WILKERSON: It says "December 31."

MR. LEONARD: Okay.

CHAIR WILKERSON: For the five-year plan.

MR. CAPP: Well, that five-year plan is a broader DOT five-year plan.

MR. SMITH: Yes. Yes.

(Simultaneous speaking.)

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MR. STEUDLE: Department-wide, or just research and development?

CHAIR WILKERSON: It says here --

MR. LEONARD: That's a research and development plan.

MR. SMITH: Research and development plan.

CHAIR WILKERSON: Yes. Research, development and technology strategic plan with six purposes; improving mobility of people and goods, reducing congestion, promoting safety, improving the durability in extending the life of transportation infrastructure, preserving the environment and preserving the existing transportation system.

Those are the top six.

MR. CAPP: So, yes, that will be out then. Probably what the subcommittee will want to do is scrub that.

And the initial comment I was making, Ken, before you came back in, is this -- Roger and I talked a few times and the subcommittee -- well, we thought what we could kind of focus some of the energy on is instead of finding new things that are out there, let's go through some of the existing things that are in the plan and see what has changed in the landscape, you know, is there any info we'd want to provide

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on priorities.

Because that's why I was just kind of making the joke about the plan being old, being two years old. I mean, a lot has changed in two years.

And so, I'll maybe just detour a little bit and maybe give some of my own perspectives from one OEM on things that have changed, really, just inside of a -- inside of a year.

And, you know, some of it's relevant to this discussion and program, and some of it's just interesting, but, you know, if I look where we were heading two years ago, let alone a year ago on the subject of automation, it was about, you know, evolving on vehicle technologies for the retail market thinking active safety features, turning them into simple automation features.

And then we had this vision that someday all the technology will work good enough that you can do, you know, highly automated or completely autonomous driving and that the connected piece would, you know, would also help that and support that.

Although, the connected piece is -- the way we see it is, really, you know, initially driven from a safety

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perspective.

And, by the way, on that point since there was a lot of the focus of this team here, you know, we are still competing with launching DSRC, a Cadillac CTS within -- it's a month or two. We're probably two months away, actually, but it will become standard equipment on the 2017 CTS.

So, I was like, you know, put them in the statement that we made -- announced a couple years ago when our chair -- when Mary Barra made that announcement at the ITS World Congress in Detroit that it will be on this '17 Cadillac, and it will.

So, it's coming -- it's coming out. So, you know, we're still assuming that the NPRM is also going to come out.

And I was at the Florida Automated Vehicle Summit last week and was on a panel discussion. Administrator Rosekind did the lunch keynote and somebody asked him, you know, what's the status of the NPRM?

And his answer was not quite as confident as I was hoping, but his answer was, you know, we're all crossing our fingers, everybody, that it will still get out, you know, before the end of the year, before the end of the administration.

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Like I said, I would have hoped to see a little more confidence, but I think he was being honest. We're crossing our fingers that it will come out, because we -- we still think, you know, that's -- that's the momentum that's going to be needed if DSRC is going to become widely deployed and realize the safety benefits.

But, you know, it is what it is with all the other political interests that have taken place with the spectrum and this and that. So, hopefully it makes its way out.

So, we're committed and still going forward on that. But, again, that's kind of focused on this retail path. And that's where we saw the automation stuff going until about a year ago -- not even a year ago when, you know, our company made this investment in a mobility company called Lyft. And now we're in the rideshare business in addition to the transportation business.

Some of you in the city areas have lived that life and been more familiar with it for years, but it was new to our company to kind of embrace these new mobility trends.

And it's really been exciting within the company and within the industry, I think. We see a lot of others getting engaged in that part of the business, too.

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We've created a subsidiary called Maven that's, you know, really focused on the app part of it and not only ridesharing, but also carsharing.

And you can also now rent a vehicle, a General Motors vehicle using Maven and you can then be a Lyft driver. If you don't have a car of your own, you can be a Lyft driver by renting a car through that.

So, all these different ideas, right? And Susan is obviously familiar with this stuff, but it's still new to us. And, you know, it's recognition not that the car business is going to, you know, go away as we know it, but that it's not completely as we know it.

There's mobility ideas. People have different ideas of vehicle ownership than they ever had before and, you know, we want to adapt. And so, you know, those of us who have been with the company a long time are really excited.

So, I've personally never seen our leadership in the company embrace, you know, completely new ideas the way they have over the last year. It's really -- it's really cool to see.

So, that was part of it was, you know, getting into the rideshare business. A lot of employees and stuff are

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saying, you know, "Why the hell are we getting into the rideshare business? We don't do this, we don't do that, et cetera."

And then people started to see the other pieces of that is that by getting into the rideshare business, you know, maybe there's a different way to tackle this technology and automation piece than the step-by-step evolution, you know, maybe cars will get reliable enough with these autonomous technologies that cars can become completely autonomous on their own.

And, you know, myself included had always been saying, you know, that's going to take a long time. It's going to take a long time.

And I would still say in terms of the days of a normal retail vehicle, a Chevrolet, a Cadillac, a Honda or whatever, becoming fully autonomous for a consumer is still going to take a really long time.

The technology has got to progress quite a bit, the costs have to come down, lots of things have to happen.

But with this realization and with this embracing of the mobility business -- and the rideshare particular opened up -- opened up our eyes is that, hey, if we were to

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focus on automating that rideshare business, what's different?

Well, what's different is, you know, if I'm going to make a vehicle that maybe only has to work in certain areas really well and drive somebody from Point A to Point B, maybe the technical problems become easier to solve.

Like, for example, maybe it doesn't have to work on every single road in the United States, and doesn't have to work in every condition. And maybe it doesn't have to be beautiful, you know, some have sensors hanging off the top of the vehicle that, you know, normally if I were to go to our design studio and even -- I mean, I've done that to ask for millimeters to get, you know, more foam to make side impact performance better, a little bit of length on the front of the car to help our crash poles for end cap and stuff like that.

And, you know, it's a tough battle, because the styling people are artists and they can tell that millimeter, you know.

(Laughter.)

MR. CAPP: And now we talk about, you know, these sensors are, you know, you guys have all seen them on cars

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in the newspaper, you know, they're as big as the stuff on the table here and they're sticking on top of the vehicle.

So, but if this is a service vehicle, a rideshare vehicle that I'm not actually selling to somebody, but it's just going to do work, okay, so maybe that changes.

And the same thing with the cost. Maybe if I'm going to put these tens of thousands of dollars, literally, of sensors on the vehicle, yes, I'm not going to buy -- find too many Chevrolet customers willing to pay for that.

But if this is a service vehicle that's giving Lyft rides for, you know, 20 bucks a pop 24/7, you can do the math and, hey, that can -- that can carry its own man. It can make money. So, that, like, completely changed the technical approach within the company.

So, then all the engineers, you know, kind of said, myself included, well, crap. If you're willing to change all that, yes, we don't have to wait a lifetime for this to happen. We can do a lot of this really soon.

And so, you know, the next piece that fell into place was not only do they want to do it really soon, you know, they want to do it yesterday, we need to find more help and more resources to go even faster than we could.

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Even the size of General Motors and all the technical people we have is not nearly enough to do what was envisioned here.

So, our company goes and buys this startup in California called Cruise Automation, which is, you know, a 38-, 39-people operation that had done a lot of really great work trying to create kind of an aftermarket solution.

And so, they had the thinking in place for taking existing cars and making them automated, but they just hadn't connected the dots for this rideshare purpose, but a lot of the thinking was there. A lot of the really smart guys were there.

So, we bought it for a really large amount of money and now, you know, those 38 people, some of them were already wealthy, and some of them now are really wealthy.

(Laughter.)

MR. CAPP: But that's the way it goes when you're on the leading edge of something really cool, but they are actually General Motors employees now.

They report in to our engineering organization. And we're in Michigan north of Detroit. We now have a vice president-level person that's the head of our autonomous and

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automated vehicle programs.

And the main focus of that right now, although it will have other things in the future, the main focus of it right now is this rideshare business.

So, we're literally going to take Chevrolet Bolt EVs, that's the new Bolt that's just being launched right now in some markets that's a full plug-in, 200 plus miles on a charge, we're going to take those vehicles and create automated versions of those that will -- that will do Lyft rideshare business.

And you've probably seen maybe some of the articles, there's maybe a dozen or so of those vehicles driving around right now in San Francisco and also in Phoenix. And we have a couple of them in Warren at our tech center campus as well.

And the whole purpose there is to develop it very quickly to the point with supervisors in the vehicle, that we can -- we can, you know, get these vehicles ready, do this rideshare business.

And then hopefully, you know, relatively soon after that, not like lots of years like we were thinking before, but a few, you know, a couple, whatever the number

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is, and not an immense number, but a small number of years, you know, we perfect it to the point where you can take the training wheels off and these vehicles could actually go pick people up and do rides in real cities without a driver in them.

So, that's kind of our current high-automation mission. So, we kind of have two paths now. This is kind of interesting.

So, when we think about priorities with the program, and it's kind of interesting -- I think others are going on similar paths. You kind of have the real path, the practical path of retail vehicles and it will be a little slower and it needs to be perfected, it needs to be cost-effective, customers are picky, everything needs to work all the time, and then this path of a service vehicle whether it's moving freight or, in this case, moving people or, you know, other models where maybe it's focused on specific domains and specific uses where you can, you know, come up with maybe less than perfect ways to accomplish a task. Those are kind of the two -- the two streams.

So, it's really changed a lot of -- a lot of our focus. There will be -- continue to be made some, you know, announcements along those lines of things that we're doing,

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but it just changed things a lot.

And then the other thing that's changed over this past year -- so, again, that's just one OEM's perspective of a change, but I think you're seeing a lot of that.

The other thing that's changed a lot is, you know, NHTSA came out with this automated vehicle policy. And that's also, I think, going to influence what's important from this subcommittee standpoint and this committee.

And that policy which came out in September, outlined about 15 things that anybody who's playing in traffic ought to consider from a best practice standpoint. These are, you know, good ideas. Make sure you think about cyber security, make sure you think about whether you modified the crash worthiness of the vehicle, make sure you think about communicating to the driver what the vehicle can and can't do, et cetera, et cetera.

It was not very specific, but it had a lot of broad considerations that NHTSA had gleaned from meeting with people and talking with people and having good best practices.

And there was a 60-day comment period. It's closed now as of a week or so ago. Most of the industry,

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I think, you know, responded pretty positively that, you know, this is a helpful framework that the agency has laid out.

We were, you know, encouraging them to move ahead with it, you know. There's a lot of open TBDs. As the NHTSA administrator says, there's 23 next steps that need to happen.

And so, you know, I think a lot of industry volunteered to say, hey, we'll work with you on these open steps. We might as well have a process that we can all get behind.

It kind of goes to that voluntary proactive spirit we talked about earlier. Very much goes to that.

Because like NHTSA said, there's no way as we're inventing and learning about this automation stuff, that they can, you know, poop out a bunch of regulations before even understanding what are we trying to assess.

So, the only way to proceed is to kind of pick ourselves up by our own bootstraps and kind of move along.

So, this kind of best practice or this guideline approach was their way to do it. And, you know, frankly, we don't see a better way either.

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So, you know, it will involve sharing some information as we're learning about our deployments in the field. From a safety standpoint, not sharing competitive information, but safety information and then, you know, learning as an industry, learning with the agency and updating those guidelines going forward and trying to be transparent about what vehicles can do and not do to help make sure and encourage a level playing field and everybody is playing safely in traffic, you know.

So, we think this framework they've put out is a constructive approach. It's far from perfect, but nobody really has a better idea. So, that will also be ongoing and iterating.

And I think there might be things, you know, from this program's standpoint, can they, you know, be relevant to evolve into some of those guidance areas that we'd want to think about in this focus of, you know, connected and automated space.

So, that was -- those are probably my background rants. And, again, what I thought -- or what Roger and I both thought that the committee may want to do, and the subcommittee, is, you know, in light of using some of those

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changes in the environment as a backdrop, let's pull up this existing strategic plan and comb through it and say, you know, what are the pieces there that the thinking would have changed given the changing environment.

And, you know, maybe make some suggestions whether it's on prioritization, expanding, shrinking, dropping, whatever.

MR. DENARO: Yes, just a couple of questions, John. Thanks for sharing all that. That's really interesting. This is Bob Denaro, by the way.

It does appear that the spotlight is beginning to shift from the general purpose consumer automated vehicle, which, as you say, is probably quite a ways off, to this limited environment-type thing.

I mean, obviously the industry gets it and is really focused. I think the public perception of the spotlight is starting to move over now as well.

But to the subject of this subcommittee on interrelationship with connected, is there an expectation of one of these shared vehicles on the infrastructure both physically -- are there some requirements there which either means you have to choose environments which have the proper

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infrastructure for that to happen. Like I said, more germane to this discussion, is there essential communications technology with the infrastructure that is necessary to support deployment of this kind of vehicle?

MR. CAPP: Actually, I'm glad you -- perfect, Bob. Thanks. Because that's a little bit of the story I forgot to connect the dot on with the connected, because that's the purpose of the subcommittee.

I'd say the short answer and the visionary answer is yes. Most of us I don't realistically see how you can have, you know, perfect automation doing all the things you might imagine and not have the connected environment not be connected.

MR. DENARO: And what are some practical examples or specific examples of what you need from that connected? Is it SPaT? Is it other things?

MR. CAPP: So, yes. So, one thing I first got to add is despite the fact that we think that, yes, the answer is yes, you need to have the connectivity, you're going to see people, including us, try to do as much automation as you can fast and quickly using the model I just talked about even recognizing that that connectivity may not be in place. So,

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we'll do other things to make do in the meantime.

MR. DENARO: Okay.

MR. CAPP: And I think that's an important point, because some may confuse that to mean that we don't need the connectivity when the reality is I think we do, but we may do some other things.

So, for example, with this rideshare model I talked about, you know, it's going to rely on a number of things including, for example, very detailed maps.

That may or may not be a viable, long-term, cross-country-type solution, but it can help make up for --

MR. DENARO: I see.

MR. CAPP: -- shortcomings in sensors or even communication. We have been talking -- another example, we have been talking on a -- in an industry forum -- a lot of you know we have this industry consortium called CAMP, Crash Avoidance Metric Partnership, where we, as an industry, have done a lot of work for the Government, for NHTSA, for Federal Highway, the program on common safety test procedures and things like that.

And in a lot of the standards around DSRC and V2P and the applications have been developed, you know, using,

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you know, leveraging resources and engineers within a lot of the industry for a common purpose.

And so, with that model we've been talking about -- it hasn't started yet, but we've been talking about a project that we get at, hey, what are some of these near-term challenges that high-automation vehicles are going to have in urban centers?

So, one of them is, yes, we may not have all the connectivity to do -- to do everything we want. And so maybe, you know, if I don't -- if I don't know, for example, a certain traffic problem or my vehicle fails or something, I mean, with this rideshare model I'm talking about, in worst case I can send out another taxi driver and go pick up that person or we can manage it from a safety standpoint. We will figure out how to do it safely.

It may not be optimized. But if you had connectivity, you know, you can dispatch, you can move cars around, but the specific example is going to bring up those emergency situations and somehow, we think, you're going to have to talk to emergency vehicles, you know.

If we've got somebody in our vehicle that's going for a ride and they have a heart attack or something like that,

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you know, we need some way to figure out, you know, does that person instead of needing to go to their destination they requested on their app, maybe they need to go to the hospital or get some help.

Again, there's probably make-arounds, work-arounds that we can do in the meantime. And we have our OnStar. You can call for help. Real people can get involved.

But from an automated standpoint, there's going to have to be connectivity to make a network like that work and I don't see any way around having connectivity linked in to enable that automation.

So, I think this connected and automated piece is, you know, probably going to accelerate the linkage of them.

MR. DENARO: So, just one more question.

So, you can't depend yet potentially when these first launch, on public infrastructure communication, because it just might not be there and, as you said, there are other workarounds and so forth, but it sounds to me like you believe it's essential that you, GM, is connected.

I mean, you're tracking these vehicles, you know what's going on and there's control in whatever is needed.

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So, that's going to be implemented, correct?

MR. CAPP: Yes. There has to be some kind of connectivity, yes. There has to.

MR. McCORMICK: This is Scott.

There's a couple of interesting things when you start looking at automation. And it was at the World Mobility Summit in September in Detroit, where Bill Ford was being interviewed at the luncheon session by Rebecca Jarvis.

And he talked about how as these cars get more and more intelligent, that the automakers are all cooperatively going to have to share what their decision-making is, because it's essentially similar to flying in formation that if a piece of the bridge falls off, besides the algorithm morality that you have to have to say, do I run into the car with a baby on board, or the guy with the handicap sticker, or off the bridge, that they'll have to know what the cars around them are going to do.

And given that we probably have -- I think the estimate I got from NHTSA was something like four -- up to 40 years where we'll have everything from a level zero to a level four, or one to five, depending on which system we want to use, intermingling on the road, that you're going down the

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road in your Lyft Bolt automated car and you want to get off the expressway, well, you're not paying attention, you're having a bad day, I'm going to be a jerk and not let you off, it's completely different than if they're all homogenous in terms of how they treat it.

Today, the level of intelligence that you have computational is considered first-order knowledge.

First-order knowledge is a rudimentary example that if a ball rolls in the street, the car can stop and avoid it. Okay? And it has to use a variety of those thousands of dollars of sensors in order to detect that.

We, as human beings, have what's called second-order knowledge, because our simultaneous thought is that a child may be running out after it.

Without connectivity, you have to have complete and full sensory awareness, extremely fast, you know, simultaneous processing going on.

If you have communication, John's car drives through the subdivision and leaves a marker in the air and its last for however long that says there's children at play. Now, all of a sudden as my car approaches it, I reduce the amount of things I have to look for in terms of threat, right?

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And how we get to where we are now to where we're going to be in 10 years from now, is something that's very difficult to forecast, because we tend to look at -- forecast the future technology very linearly.

We say, what are you doing with your ADAS, how does that move to active automation, how do you get to autonomous, when reality is it's a multidimensional equation that says right now processors -- the human brain processes 6.4×10 to the 18th transactions per second. That's more than all the microprocessors in the world combined.

But by 2025, if we stay on Moore's law, which looks like we shall for a few more years, we should have a desk-level computer you could buy from Dell that will have that -- the human -- the transaction processing capability of the human brain.

Coupled with that, that we're going from where we are now with 4G LTE, advanced LTE to 5G, which has the capability of bringing down a full-length DVD movie in less than three seconds -- I just witnessed a few months ago in southern China, the test of 5G point to point where you don't use a cell tower. Your car has a transceiver and it only goes a kilometer or so, but now you're able to do a whole lot more.

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And now, we look at it and it says I have a massive pipeline with extremely fast switching that I don't have to go through a tower for. I have CPUs that allow me to transact information much faster. And I have the ability as you become this self-forming ad hoc network rolling down the road, is that China might be able to do the thing like they do in research and study and say, let's combine computational processor of the surrounding vehicles for road weather, traffic assessment and forecast and do things that we never can expect right now.

So, as we're going down that path, you know, and as these other aspects are coming, there are some serious risks, you know. I mean, we've never had a malicious attack on a car in a while, you know.

Researchers have done it, but we don't have anything valuable in our car right now to attack and it's not necessarily a scalable thing. But as we move down that path, we will, right?

And so, the next question is, is that, well, okay, if we continue how historically we put technology into cars, whether it's an aftermarket or OEM or whatever, now the mere complexity, the hundred million lines of code that you have

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in there, you have to worry about things like software collision.

I mean, there's a hundred thousand known bugs from Microsoft's last OS they put out. And they discovered 200,000 more in the first two weeks, because it's impossible to test if your program is making a function call at the same time yours is, what the unintended consequences are.

And then you've got to realize that there's a very well-understood rule of thumb of one bug for every 4,000 lines of code. I don't care if it's medical or automotive or machine-built code, it's there. Well, however many lines of code, that's 25,000 bugs.

I have a problem here, I throw the apple away and get a new one. I don't want that to be the environment that occurs in a car.

So, we've got a whole new type of architecture and thinking that has to go on as these guys move forward bringing in these components and these capabilities, that I don't know that there is a common frame of reference in any other industry.

I think you guys are going to have to discover that all yourselves in terms of how to create that viably.

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CHAIR WILKERSON: Tina.

MS. QUIGLEY: Well --

CHAIR WILKERSON: Tina, then Susan.

MS. QUIGLEY: Scott, now I lost my thought.

CHAIR WILKERSON: Okay. Susan. Once Susan starts, you'll --

MR. McCORMICK: I have that effect on women.

(Laughter.)

CHAIR WILKERSON: Go, Susan.

DR. SHAHEEN: Okay. So, in the conversation -- I'd like to follow up on the shared fleet discussion and the gap analysis.

So, as we -- we talk about the convergence of a lot of technologies possibly having transformational effect. So, shared mobility, IT, electrification, automation and connectivity, right? I think that there is a number of key gaps that we should be looking at.

I do think that the shared automated vehicles are going to need connectivity to the infrastructure to the curb, because at some point we're going to have to prioritize access to that curb space, right?

We're going to have to prioritize it either by

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occupancy of that vehicle, needs associated with that vehicle and I don't think we're talking enough about the curb space access and the connectivity of that vehicle to that. Okay.

The other area is the geofencing. So, airports are doing a lot of the geofencing technology so that they understand precisely what the impacts of these ride sourcing vehicles are on the ecosystem.

So, I'm on a Transportation Research Board project which is really fascinating, looking at the precision that the airports now have and understanding what the impacts of shared rides are on other modes, including parking. And they can do it on a quarterly basis because of that geofencing.

So, I think we may need to start to geofence the cities to have a better understanding of what the impacts are and how we can streamline the movement of vehicles, including the shared fleets.

MR. BELCHER: John, isn't that a big part of what you're doing with Lyft? I mean, that was the thing that I heard that I hadn't heard before, is you guys are using geofencing for your autonomous-shared vehicles to keep them in a much more limited space.

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MR. CAPP: Yes. Keep them in their playpen, yes.

MR. BELCHER: And it probably then that's what enables you to do the autonomous vehicle deployment so much more quickly.

DR. SHAHEEN: Exactly. I mean, and this is --

MR. CAPP: You can expand the --

DR. SHAHEEN: -- this is how car2go, how ReachNow -- they're two carsharing operations, they're also a form of on-demand mobility. You still have to walk to those vehicles, but eventually those automakers will also automate those vehicles, right?

And so, how is one-way carsharing being done in cities? Well, it's being done through geofencing technology. So, I think this is an area of gap analysis that we should look at.

And then the third piece, and then I will conclude my remarks, is electrification. So, we're talking about the convergence with electrification.

John, you talked about how fleets -- shared fleets can bring down the cost of automation that can also bring down the cost of electrification --

MR. CAPP: Absolutely.

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DR. SHAHEEN; -- and suddenly make electrification

--

MR. CAPP: Yes. It's no accident we're using Bolts for our experiment.

(Laughter.)

DR. SHAHEEN: There is absolutely no accident you're using that car. I'm very familiar with the modeling. So, how are we going to do the charging?

So, if we're not connected to the infrastructure for the charging, how are we going to charge these vehicles?

So, I think those are three areas that are really crucial and I'm not sure the strategic plan -- I haven't looked at it in a long time. I'm sorry, Ken -- addresses this.

I kind of think it probably doesn't just because some of this work is on the cutting edge, but I think if things are moving at the pace that they are, which our research suggests, things are moving much faster -- and, John, all your comments are to that effect -- I think there is a big gap here and there is a role for a connected vehicle.

You know, there's a lot of talk about fully-autonomous vehicles by some of the other players in

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this space, but I would prefer to see a shared electric connected/automated vision, because I don't understand how these vehicles are going to work if they're not connected to the infrastructure.

MR. McCORMICK: Well -- this is Scott -- there's an interesting -- there's an interesting thing. There's -- one of the entities that I advise is the EV Charging Center for Shanghai.

There are over 105,000 electric vehicles just in Shanghai proper itself, and they have a room with a wall, you know, half the size of this wall, that has a map and shows not just the location of every single EV in the city, but whether it's running, whether it's being charged, whether it's fast charged or standard charge, and where its origin and destination is. And if it's in transit, what road it's using.

And I asked, I said, "How did you get them to provide that information?" And they went, "Oh, under Marxism we just tell them we have to have it."

But that gave them the ability to --

DR. SHAHEEN: Of course.

MR. McCORMICK: -- look at it and say, well, where

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do I need charging infrastructure? Where do I need fast-charging infrastructure? How do I manage my grid to charging infrastructure during peak hours, et cetera, et cetera, et cetera.

So, I mean, there are examples of how this is being done with a huge number of vehicles, right? And so, that's something that's worth looking at in terms of how you manage that.

Because of the 188 car manufacturers in China, 90 percent of them have the capability of building electric vehicles --

DR. SHAHEEN: Absolutely.

MR. McCORMICK: -- and 50 percent of them have the ability to build automated vehicles. There already are eight Chinese car companies with fully-autonomous vehicles driving around the city of Beijing.

DR. SHAHEEN: And it's going to be robotaxi on steroids in China.

MR. McCORMICK: And the problem is --

DR. SHAHEEN: I mean, that's very clear.

MR. McCORMICK: -- they're discovering is that actually creates more traffic.

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CHAIR WILKERSON: What -- I had a -- I just had one comment that tied to yours when you were talking about the curb access --

DR. SHAHEEN: Yes.

CHAIR WILKERSON: -- and prioritizing --

DR. SHAHEEN: The geofencing.

CHAIR WILKERSON: The geofencing and prioritizing access. One thing that I've been thinking about is not every car is equal, right --

DR. SHAHEEN: No, absolutely not.

CHAIR WILKERSON: -- in terms of its safety.

DR. SHAHEEN: Absolutely not.

CHAIR WILKERSON: So, one of, you know, I think about -- you talked about a car stopping. Well, we talk about at Michelin, the fact that our tires can stop faster than others.

So, if you're in a platoon, one car might not stop as fast as the other if their tread wear is not up to date, you know, up to par.

So, part of it is there might be some way to -- when we start looking at how we assess quality and priority, does looking at one of the capabilities of not only the

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technology, but the utility of that vehicle, is it up to par, should that car get a priority in a high-speed lane, or should that Uber car that has no tread depth and no safety sensors, no seat belts or what have you that hasn't met its inspections, does it get a lower priority in the system that you're prioritizing for the curb or what have you, which I think ultimately can start to affect the behavior --

DR. SHAHEEN: Oh, yes.

CHAIR WILKERSON: -- that you're trying to get to. So, it's just -- it's out there, but I -- you know, just as a thought.

DR. SHAHEEN: Real quick I just got to share an anecdote briefly, Sheryl. So, you mentioned --

CHAIR WILKERSON: And then Scott.

DR. SHAHEEN: I appreciate that comment, though, about the vehicle itself. You know, I -- as a researcher in this field, I'm continually thinking about, like, the occupancy or the prioritization from an equity standpoint, but not necessarily from the quality of the vehicle.

We also talk about it in terms of prioritization because of the cleanliness of that vehicle. So, does an electric vehicle get better access than --

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CHAIR WILKERSON: Right.

DR. SHAHEEN: But I think the maintenance of the vehicle particularly in the context of a peer-to-peer-based business model makes a lot of sense.

CHAIR WILKERSON: But -- and I'll let Scott go, one of the campaigns that Michelin has is we have a public performance and responsibility management. Every facility around the world looks at a road safety initiative and we look to how we can impact that. And one of the things we looked at was the statistics on fatalities and road safety.

And we figured that by doing research, we found out that the number one killer was teens. And why were teens being killed? Well, part of it was they had no -- they were having tire incidents.

So, they had no knowledge of how to maintain their tires, they didn't know what tire pressure was, they didn't know what their PSI was, they didn't know how to assess tread depths.

So, we embarked on a campaign called 50 by 2020, to get all of the motor vehicle -- DMV driver's manuals to include tire pressure and tread depth.

And we, in 18 months, got 34 states --

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DR. SHAHEEN: Fascinating.

CHAIR WILKERSON: -- to modify that, which we hope will hopefully take the fatalities down, but also address the behavioral traffic safety component of that.

DR. SHAHEEN: Interesting.

CHAIR WILKERSON: So, it's just another example of --

DR. SHAHEEN: That's really helpful.

CHAIR WILKERSON: Uh-huh.

MR. McCORMICK: Tina has been waiting.

MS. QUIGLEY: I just wanted to share an anecdote.

CHAIR WILKERSON: Tina, you had your hand up.

MS. QUIGLEY: Okay.

CHAIR WILKERSON: Scott is next.

MS. QUIGLEY: You made my point for me when I got asked the first time. So, I checked it off the list, but I want to share an anecdote on the tire.

So, up in northern Nevada way in the mountains, there's this kind of semi-secret place called the Nevada Automotive Testing Center. It's where all the military tests all of their stuff.

So, the rancher who runs -- he's not a rancher.

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He's an engineer, but he looks like a rancher. He invited us up there, because he knew we were interested in autonomous vehicles.

He wanted to show us kind of for real what's going on in the state of autonomy.

He said, "I know you guys like to think like autonomous vehicles are going to be out on the road and we're going to have fleeting, platooning trucks any time now, but let me do a demo for you."

So, he got two Freightliners or trucks -- cabs going. He had equal -- he had trailers -- different trailers, but of equal mass on the back, but he had different tires.

CHAIR WILKERSON: Rolling resistance.

MS. QUIGLEY: And then -- and he got them going up to 60 miles an hour around the track and they both had the same autonomous technology employed in them.

And then he triggered a braking action where they both had to brake and one of them stopped fairly quickly, another one went like probably half a football field farther than the other one.

And so, he says, "Are you really ready to put these

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out?" And he said, "The only difference between these two was the trailer and the tires." So, I thought that was a good story.

CHAIR WILKERSON: Yes.

MS. QUIGLEY: It was a cool -- it was a cool thing to see.

MR. BELCHER: So, I mean, I guess my question for you, Ken, is -- I'm not going to put you on the spot like I did the last time.

MR. LEONARD: Go ahead.

CHAIR WILKERSON: He's got his armor on. You can't see it, but --

MR. BELCHER: So, this -- we're -- the -- everybody here is a legacy player. I mean, we're all trusted, we talk to you, we're engaged, but it's the Wild West out there right now.

I mean, there are, you know, we're all having meaningful conversations, but, you know, you just saw that when NHTSA shut down that -- I forgot the name of the company, and then they released their autonomous code onto the internet for anybody.

MS. QUIGLEY: Oh, yes. Yes. Yes.

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(Simultaneous speaking.)

MR. BELCHER: I mean, and we just had the meeting that you spoke at last week and, you know, there's a lot of people out there that are completely unrelated to what we're doing and what we're thinking, and they're just going their own way.

And, you know, standards aren't, you know, standards -- the hell with standards. We don't, you know, we don't have time for standards.

And so, I guess my question is in this new environment, I mean, I just had an argument with my board chair who is now advising some app company about, you know, the difference between 5.9 and 5G. And I'm like, really?

He's said, "Oh, well, you know, it's all new." I'm like, "No, it's not all new."

(Laughter.)

MR. McCORMICK: It's not all new.

MR. BELCHER: But -- so what can we do -- is there anything that we can do to help, because I think that -- I mean, we -- you can control us. I mean, you know, because we're all --

MR. LEONARD: You're kidding.

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MR. BELCHER: Huh?

MR. LEONARD: You're kidding.

(Laughter.)

MR. BELCHER: No, but -- but we're all -- we all are playing in the system, you know. You can control us or you can't, however you do, but we're all playing by the rules.

You've got a whole group of people who aren't playing by the rules right now.

MS. QUIGLEY: Well, they don't even know there's rules.

MR. BELCHER: They don't even know the rules. And they -- yes.

MS. QUIGLEY: They don't even know that there are rules.

MR. LEONARD: They don't care.

MR. BELCHER: Right. I mean, is that just the reality of where we are, or is there something that as a group, we can be helpful?

MR. LEONARD: Yes.

MR. BELCHER: Okay.

MR. LEONARD: And maybe not. I don't know. Because, like you said, it's changing so quickly.

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It's okay that you haven't read the strategic plan in, you know, in a little while, because while we take that as strategic guidance, at the same time we continue to shape what do we do.

So, kind of the question I want to ask this group and the challenge I'm facing inside the JPO, and I think this is a larger challenge inside the Department, is what are we going to do? Where do we make our investments? What is the best strategy?

And I'm sure I mentioned to this group when I came on board -- December 2nd was my four-year anniversary as the Director of ITS.

I remember talking to folks in ITS about automated vehicles and why, you know, we needed to be doing research in automated vehicles.

And the response was, "We do connected vehicles here." And I was like I know we do connected vehicles here, we need to be doing things on automated vehicles.

And Mike Schagrin was asking for \$25,000 in automated vehicle research. I was like, well, it's the right idea, it's the wrong order of magnitude.

So, I'd like to say we've put tens of millions

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into automation, but I can only say that if we talk about what we've put into connectivity that's leverageable.

At the same time, the whole -- all across the private sector in so many different domains, people are in this space and we can't control that.

What I am trying to figure out is, what can the ITS JPO do? What is an appropriate federal rule? How do we -- how do we make sound investments in supporting research and policy?

And I don't really think what we need to do is work on the technology so much of -- you know, that's up to GM and Tesla and anybody else who's building vehicles in this space.

And I say that at the same time, and I know at some point NHTSA will have responsibility to say, well, is that vehicle safe enough to be on the road? So, I know there's some support I have to give NHTSA in that regard.

I know that Highways is trying to address policy issues. FMCSA, which hasn't been a real embracer of technology, is now out there saying, you know, they're looking at international forums and saying commercialization of automated vehicles -- automation of

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commercial vehicles is coming quicker than we're prepared for and they're now starting to engage in this.

FTA is already doing it. So, I'm trying to figure out from the ITS JPO perspective, how can I support a grand strategy, a broad, multi-modal portfolio view of supporting all of these different constituencies around the Department and having some grasp of reality about what's happening around the world, you know, because we're not tracking what's going on in China inside the JPO.

In part, because China, as I mentioned in the panel, is not exactly our model for road safety, but they -- that doesn't mean that they won't be able to come through -- come up with some breakthroughs.

And, also, if adopting Marxism is a precursor for successful technology deployment, we might have some problems with that, too, but how do we come up with a strategy?

How can we in the JPO with the resources we have, help the rest of the Department invest the resources that they're putting into this space and give them guidance and then communicate that up to what's going to be a new administration, a new secretary, a new host of modal

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administrators.

So, I'm really wrestling with how do I move the JPO away from being a group that focuses on some specific research issues?

And the policy document that NHTSA came out with, we funded the research at Volpe that's cited in that work. We're funding work for FMCSA right now to help them deal with commercial automation.

We're funding work for Federal Highways, but that's really just at the policy level. How do we continue to do that in a space that's going to evolve over 15 or 20 years, you know?

And even automation is not standalone, because it's kind of tied to Smart Cities. And we'll talk about that later, I'm sure.

I'm trying to figure out how do I manage a portfolio that even the Secretary of Transportation or the President of the United States can't control, because there's so many other players in it.

So, if you folks can give me the blueprint for that, you will have earned your pay.

(Laughter.)

(Off record comments.)

DR. SHAHEEN: Well, you're going to revisit these modal plans every year, correct? That's what I wrote down. Is that --

CHAIR WILKERSON: For the five-year strategic and the multi-modal every year.

MR. SMITH: Yes.

DR. SHAHEEN: Yes. That feeds into the strategic plan, because, I mean, I think what's essential is a nimble understanding of what's going on in the field.

I mean, I think tracking all of these developments, what's going on in Asia, is essential because the scaling of some of these things is at a level we're just not used to here.

MR. SCHROMSKY: And that's -- and in my industry, we would model after Europeans, right, for mobility, right?

DR. SHAHEEN: Yes.

MR. SCHROMSKY: -- facilities were superior to --

DR. SHAHEEN: So, you'd look to European examples.

MR. SCHROMSKY: We would look at --

DR. SHAHEEN: Yes.

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MR. SCHROMSKY: And obviously we were on a CDMA track. We went to an LTE, which is more of an open, universal standard.

A couple things, there are things I hear, connectivity and automation. I think it gets thrown around -- Bob, to your point, and you're back on GPS, right, and you mentioned the word "connectivity."

I look like Christmas season, right, about five years ago, everybody probably got a Garmin or TomTom GPS, right?

DR. SHAHEEN: Yes.

MR. SCHROMSKY: Well, you probably don't -- nothing against Garmin or TomTom -- you probably don't use that. You use a cell phone.

Why? Because you've introduced connectivity to standalone GPS. Now, you have like Google Maps and ---

DR. SHAHEEN: It's far superior, yes.

MR. SCHROMSKY: Exactly. Because you connected and you've fed intelligence in, right?

What I hear, what you're talking about, and I was sitting with the FAA as they make their network smarter and use GPS --

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DR. SHAHEEN: Yes.

MR. SCHROMSKY: -- people notice, and I get distracted because I'm facing that way, I'll see a plane going every about a minute or two.

What the FAA is preparing to do is say, what if a plane goes every 30 seconds? Because they're tracking the planes and they're stacking them out 50 miles out rather than circling.

And so, just imagine the carrier. I mean, you kind of hear that already, but constantly hearing that. So, unintended consequences as I zero in and use connectivity.

So, what I look at and, you know, it's just my background -- and, Scott, you would know this as well -- we assume there's connectivity. We assume that connectivity is free.

There are all these -- if you look at somebody like Uber, right, big Verizon customer, right, they're using commercial services while you're trying to connect the dots between the two.

You're trying to take a location beacon of the recipient, meaning I need a ride, and the driver. And now, if you noticed, what Uber interjected is I want to text the

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driver, I want to communicate with the driver, right?

Well, how do you do that, right? I mean, you're using commercial services that Uber or if it's OnStar well go to the carriers and buy it and that's a sunken cost of delivering a service mechanism.

I think what we -- when I first got on this committee, what we were really looking at is, which I don't think has been addressed, and we kind of dance around the DSRC and the 5.9, right, what network are you going to use, right, or how are you going to do that?

Because I think we kind of overlooked that and said, oh, we're just going to assume this is going to happen.

DR. SHAHEEN: Right.

MR. SCHROMSKY: That doesn't, you know, you got first net, you got everything else out there. It's very expensive to build a network, I will tell you that.

I mean, it's literally -- I mean, for us, we're talking about \$130 billion investment and it's still going with an annual five billion just in the network. And that's not even counting the 5G. So, we assume a lot of things that are just going to work, whatever may be.

I think there's a public-private partnership that

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I think is -- there's the only way you're going to be able to do it.

I think using multiple technologies where we look at drones and then people are like, oh, I can just do that, well, yes, you can go to points A, B and C, right? But guess what. If I did A, B, And C and now I want to go to D, well, how do I do that?

It's got to come all the way back and then I got to reprogram it and send it back out there, right?

So, that's where I kind of look at a connectivity plan and I'm like, okay, I hear it, I agree with it, you all have great examples, but we're fundamentally overlooking that transport piece.

And knowing my background, it's a lot of assumption. It's just, oh, it's just out there and it's free.

It's not a free resource. I mean, that is a, you know, very expensive -- we're into 600 megahertz. We go through options, I think we're on Plan B right now. The first one total about \$53 billion. So, it's a lot of money.

I'm not saying you have to use all commercial services, but I agree, you know, you use 5.9, DSRC, maybe the

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infrastructure -- Raj, to your point, I'm using that, you know, passive, if you will -- I just think, you know, I'm curious what JPO -- we just assume it's there. And it's there, but there's more to it, if that makes sense.

MR. BELCHER: Let me just add one thing to what you just said, because I think it's lost on most people. And that's as we move into wireless, wireless doesn't mean no infrastructure.

The infrastructure's got to be there. You're laying more cable now than you ever have.

MR. SCHROMSKY: Especially if you look overseas. My biggest project, you know, macro-sites, is the high-density -- George and I were talking this morning.

MR. WEBB: I want to chime in on that.

MR. SCHROMSKY: The microcells is probably the biggest growth that we have right now as adding capacity.

So, when you start looking at, you know, there's probably 350 million devices here in the states, you talk about what everybody is, you know, talking and using right now.

If you're going to ratchet it up to two million plus as you automate and connect your vehicles -- and I don't

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mean, you know, they're not going to suck a lot of bandwidth, but there's a lot of infrastructure costs to maintain. I mean, you're asking business models for us to do that.

PARTICIPANT: And prioritization, right.

MR. McCORMICK: Well, unless it's point to point.

CHAIR WILKERSON: Who's next?

MR. SCHROMSKY: Which you could do. I mean, you are doing --

CHAIR WILKERSON: George is next.

MR. McCORMICK: I mean the tests I witnessed, they were less than one millisecond point to point.

CHAIR WILKERSON: And then Bob.
George.

MR. WEBB: Yes. I was talking to Bryan about this earlier on the break that Florida is being hit by these companies wanting to put monopoles 90 to 150 foot high. They're trying to get into our right-of-way for free and they're then selling services to the carriers as far as saying, you know, we'll provide the pole, you put these here.

And so, you know, the distribution of these things is hidden. I mean, elected officials are not necessarily liking the appearance as far as the aesthetics of having these

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just scattered everywhere. So, it's a real interesting issue and a political issue for us.

We just had our Florida Association of Counties and we had one of the company's mobility come in and make a presentation. And all the board members and the commissioners are nodding their head, yes, yes, we know it's necessary, but we just don't want them in our backyard, you know, that kind of stuff. So, it's out there as well, just affecting the local government.

CHAIR WILKERSON: And then who was next? Bob was next.

MR. DENARO: Yes. Back to this connectivity benefits -- and, John, I think you kind of nudged up against it, but you didn't go completely there -- there's a possibility that there is a complete change in the way vehicles will be tested and fielded, in my opinion.

And the analogy is your Microsoft Office on your computer that you open your computer one day and there's this message saying Office needs to install this update that was already downloaded, by the way, and you just do it, typically.

That's happening with cars once you have connectivity. Tesla is a good example of that. They're

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updating their software all the time.

But what occurred to me is, this is kind of interesting because the comparison -- maybe it means that you can put vehicles in the field that have known and unknown defects that you in normal situation without connectivity, you would never do that. You would test this thing for years and years and get that out and so forth. But with connectivity, you take the chance. And the question is, what you want to avoid is accidents and fatalities due to defects.

We already know that with conventional system, that there are recalls because we screw up. We get a vehicle out there and there's accidents, potentially fatalities or whatever, and there could be a big recall for that. We've done something really bad.

If we instead put vehicles out that are known to be deficient, but we -- one accident, boom, and we can correct that overnight to every car, at the end of the day, which process is going to result in fewer accidents and fewer fatalities?

And it may be the connectivity route and a little bit sportier attitude about getting vehicles into the field already and learning from that, given that we have the ability

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to update, might be the best thing for citizens compared to what we have now.

And once you have electric cars, this gets a lot easier. Tesla has the unfair advantage that almost everything in that car is addressable.

With conventional cars, that's not true. But as we get to electrification, that becomes more and more true. And to me, it's just a fascinating possibility that this rushing vehicles to market before they're ready is not necessarily a bad thing. It might be better.

CHAIR WILKERSON: So, are you getting at enforcement or oversight of the -- I'm just trying to get a --

MR. DENARO: I'm sorry, what was your question?

CHAIR WILKERSON: I'm trying to understand the -- just to get some clarification --

MR. DENARO: Yes.

CHAIR WILKERSON: -- about monitoring and enforcing.

MR. DENARO: Yes. Well --

CHAIR WILKERSON: Because if you're saying -- right? So, you'd have to have some self-enforcement --

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MR. DENARO: So, that monitoring is within the company itself like GM, you know, and this has to be built into the whole system that they're monitoring everything that's going on there, near misses, sensor failures, things we missed, you know, the camera saw one thing, monitor didn't see it or vice-versa, whatever it is.

And as -- so, there has to be an entire infrastructure -- organizational infrastructure behind this that's evaluating and analyzing this kind of stuff.

CHAIR WILKERSON: Uh-huh.

MR. DENARO: And then applying the updates and making those corrections hopefully preventing an incident before it happens.

CHAIR WILKERSON: Right.

MR. DENARO: But at worst, correcting for everyone else based on just one incident whereas in a normal production in testing cycles, you have to wait until there's dozens of things and someone says, oh, boy, we got a problem, you know.

CHAIR WILKERSON: Right.

MR. DENARO: You know, that's --

CHAIR WILKERSON: So, the vehicle inspection --

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MR. DENARO: Maybe this is better.

CHAIR WILKERSON: -- will be very different, right, in the future?

MR. DENARO: Well, that's --

CHAIR WILKERSON: The vehicle inspection or how do you --

MR. CAPP: That's a real good --

CHAIR WILKERSON: How do you address the enforcement or the compliance of that vehicle to make sure it meets certain standards of the feature?

MR. DENARO: Well, maybe this becomes part -- and I read through the automated vehicle guidance when it came out, but I don't remember what they said about connectivity.

But, you know, maybe this eventually becomes if not essential, but at least a voluntary principle by companies implementing this. We have got to monitor that data coming out of that vehicle and fix problems -- be able to fix problems and do it.

MR. CAPP: That's a great point, Bob. Yes, the federal policy, it talks about -- there's a couple sections of the 15 that talk about safety data, you know, gathering whether it's crashes --

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MR. DENARO: Yes. Right.

MR. CAPP: -- near crashes, whatever needs to be hammered out for the purposes of common learning.

It didn't really focus on the connectivity part. I mean, you've put it in a really good perspective. So, I've got that.

I think that is something for us to think about because not only is it an enabler for the technology, but, you know, clearly advancing the safety aspects of it.

Maybe there is something from a program standpoint to learn about or establish along those lines. I mean, an example of how we've done a little bit of that on a small scale is utilizing OnStar on existing vehicles.

We've been able to get information with customers' consent, about how they use their collision warning features and lane departure warning features and things like that. We did a study with NHTSA that was published and we're in the process of doing the second phase on braking systems.

And, yes, in the past to put a feature on a car, I know we need to wait, you know.

MR. DENARO: Yes.

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MR. CAPP: Even from the IHS, we're waiting for insurance data to show up or crash fatalities to show up and then 10 years later you say, wow, this feature didn't do much. Or it's a stability control and you say, oh, my God, it's the best feature since sliced bread, literally.

But in this example here, we were able to learn, you know, within a year that cars that are in the field, how people are using the feature, how many alerts they've had and, you know, we can make it better.

So, it's kind of an on-steroids example of what you're getting at, Bob. I like it.

MR. McCORMICK: This is McCormick.

That kind of nicely segues to a question I had on certification and what thoughts you and Roger might have had on that.

Because, you know, I know after things like Diesel-gate, people are going, well, do we just want to fine somebody \$10 million or do we want to have third-party validation of compliance software? And then we find out that a few of us had a workaround for 50 years.

So, you know, but --

MR. CAPP: So, we did talk about -- a little bit

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-- my thought, this idea of certification models, I mean, I think that's more in the regulatory realm, you know, and the federal policy talked some about it.

And it's going to be a long road to go down in terms of what are the right models for assurances, whether it's regulation, whether it's type approvals, things like that. Open to it, but I'm inclined to think that's really not a primary scope of that item.

MR. McCORMICK: Okay.

MR. CAPP: That was one of the modifications that Roger and I were sketching up was not to focus so much on that, let's focus on some of the things that, you know, we can influence.

PROFESSOR RAJKUMAR: John, can you talk to the cyber security issues that we are looking at?

MR. CAPP: A little bit. The -- I mean, that's one of the 15 guidance items that's identified.

They really didn't put any new information in for that because there's already a lot of work going on. And you're probably smarter than I am on that with cooperation and collaboration that's going on between different governmental and academic and industry people working

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together to establish some guidelines.

There's this site for sharing information on cyber security, but, you know, NHTSA put that in the policy. One of the things that, you know, if you're going to put vehicles out in public, that you owe to tell -- to tell NHTSA, but, in effect, to tell the public, hey, what have you -- what have you put in place to avoid all the doomsday scenarios that Scott was listing.

Do you have something specific, though, Raj, that we should try to click on this subcommittee's focus?

PROFESSOR RAJKUMAR: Sure. I guess it certainly looks like there needs to be multiple levels of protection, the three portals for activity at the 3, 4G, 5G or DSRC. And of course we have the various places within the car, USB and OTG. You have the CD-ROM device with the radio and all of that.

MR. McCORMICK: Well, but we ought to back up and ask ourselves -- and this is -- I'm channeling Roger Berg here -- is, you know, what is the -- what is the function and value that this committee adds to that topic?

Right. Because the purpose would be to provide them with a recommendation of these and what they should

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study, what they should analyze, what they should pursue.

So, not so much as addressing the details of any particular over-the-ear threat surface that might exist on a car, because the automakers are already doing that, but really what was it when we'd be asking -- excuse me. I'm still trying to get my voice back -- asking this committee to weigh in on -- I can't --

PROFESSOR RAJKUMAR: I thought you captured the benefits of updates very well, basically deploy them and then update, but I guess I think like pretty much anything else in this domain, it is always a dual-edged sword as well.

MR. McCORMICK: A what?

PROFESSOR RAJKUMAR: Double-edged sword.

MR. DENARO: Double-edged sword.

PROFESSOR RAJKUMAR: I guess in the aviation community there have been many instances where they've made quote unquote a very innocent update ---

MR. DENARO: Right.

PROFESSOR RAJKUMAR: --- and the autopilot goes crazy up in the air.

MR. DENARO: Yes. Yes.

PROFESSOR RAJKUMAR: And they are having a hard

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time getting it back. So, I guess before we do the update, what we have deployed, we have collected lots of experiences over tens of thousands of cars or maybe millions of miles, and this one update that you do, which you believe is the right thing to do ---

MR. DENARO: Right.

PROFESSOR RAJKUMAR: --- does not have that same testing sequence if you will, and maybe something, the one in a thousand updates that will be that way, and that causes problems. But it's always a mixed bag.

MR. DENARO: That's a good point. Although, I would argue that the ability to do that allows you to make mistakes, also, because you make the mistake and tomorrow morning you change it again.

PROFESSOR RAJKUMAR: Yes.

MR. DENARO: But you make a good point and if I were implementing this in a company, I'd want to have some controls in there and -- yes, that makes sense.

MR. SCHROMSKY: So, we're doing software updates in a real case recent with Samsung with the new S7 catching on fire, some percentage.

MR. DENARO: Yes.

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MR. SCHROMSKY: So, what we're actually doing is pushing -- people weren't returning them.

MR. DENARO: They what?

MR. SCHROMSKY: They weren't returning them. They liked the device so much they didn't want to return it.

MR. DENARO: Well, how are they flying airplanes, because --

(Laughter.)

MR. SCHROMSKY: What we're doing is, we've done this like we had a recall and there was two versions. And we're actually putting software updates. And what we're doing is to nudge them, is we only allow the battery to power up to 80 percent, the next update will only allow to 60 --

(Laughter.)

MR. SCHROMSKY: -- making the device rendered useless by doing exactly what you're saying.

MR. DENARO: So, another benefit.

MR. SCHROMSKY: So, It's the same concept, right? You're kindly enforcing the will, then physically now the last thing would be is we get to the SIM level, this is -- we just -- we go through the -- like, for instance, on ourselves, anybody that had one internally, they basically

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shut off your phone number if you didn't return it, right?

So, there are ways of doing it and getting that data, right, which GM does a lot and -

MR. DENARO: That sounds like --

MR. SCHROMSKY: Which I agree with you, but I don't think a lot of people realized, and we've talked about this before, it's one of those assumed.

And, John, you said it right. There's an End User License Agreement (EULA) there. And the EULA license agreement consents that they get that data to make it available and use it right.

A lot of people don't realize how important that is when it comes to this technology and sharing this information either willingly or unwillingly.

People don't realize that EULA is very, very important when it comes to this kind of information and sharing. People don't realize --

MR. DENARO: When you say --

MR. SCHROMSKY: I'm curious to see JPO -- I mean, that -- you have to consent to do that and people don't realize that.

MR. DENARO: When you say it's important, you

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mean that maybe people are not consenting and they should be?

MR. SCHROMSKY: Well, I mean, you can only get so much subset of the data, right?

MR. DENARO: Yes.

MR. SCHROMSKY: I mean firewalls and we're right outside of DC about bulk collection and that's not -- that's frowned upon, right?

MR. DENARO: Right.

MR. SCHROMSKY: There's rules against that good, bad or indifferent, right?

MR. DENARO: Right.

MR. SCHROMSKY: But one of the things that we -- people raised, how do I get that analytics?

MR. DENARO: Right. Okay.

MR. SCHROMSKY: Right? And when you get very specific to an automobile or to a phone, I mean, there's certain things passive that you can do, counters and different things that you can get, but a lot of it like if you're doing studies or research, that is the first thing. You're opting in and consenting to willingly share information.

Now, what they do with the information, the end

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user necessarily doesn't, you know, realize until after the fact, what they actually mean, what they should put.

MR. McCORMICK: Yes, but I think that whole discussion is somewhat pointless. I mean, if people realized how much personal information they give to use this device, what comes out of a car is trivial.

MS. QUIGLEY: You're going to need some help messaging that one.

MR. CAPP: Yes.

MR. McCORMICK: Yes.

(Laughter.)

CHAIR WILKERSON: Kirk.

MR. STEUDLE: So, which of this conversation -- interesting conversation. What of it falls within the realm of JPO?

I mean, because a lot of this is NHTSA and you're going to have little influence with NHTSA, other than personal influence, to get them to do what you want.

So, I mean, again, we're having a good conversation about it. But in order to be useful, you know, this is providing advice to JPO. We've got to make sure that we tailor it to advice that's actually useful.

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CHAIR WILKERSON: Right. I was going to say I appreciate that, but I also think it's healthy to have some opportunity to sort of talk outside the box so we know what we are or are not going to do, right?

MS. QUIGLEY: Well, real quick I just --

CHAIR WILKERSON: Wait. I think Ken was --

MS. QUIGLEY: Yes. I'm sorry.

CHAIR WILKERSON: And then we'll go back to Tina.

MR. LEONARD: I mean, it gets back to Scott's question and your question. The things I'm interested in is how do I structure a program? What -- how does this area impact the modes? How does it impact our infrastructure?

I mean, sometimes people say, you know, is the infrastructure ready for self-driving cars? Or you can flip that around. Are self-driving cars ready for the infrastructure we have?

MS. QUIGLEY: Is there a conversation going on between those who are developing self-driving cars and those who are developing the infrastructure?

MR. LEONARD: Well, in fact, Highways is working on some policy issues, but it also -- it gets down to a very local level. How often are you going to do your lane

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striping, you know.

MS. QUIGLEY: Right.

MR. LEONARD: You know, people -- I've heard people say, wow, we're not going to have to put up stop signs anymore.

PARTICIPANT: 40 years from now.

MR. LEONARD: And even 40 years from now, will we really -- will we have totally eliminated a mixed fleet and they will no longer be?

I, you know, I find that hard to believe. I think 40 years from now Randy Rogoski is still going to have a '57 Chevy in his garage.

MS. QUIGLEY: Same here.

MR. LEONARD: And there will be others like him. And you can say, well, but there will be rules. You won't be able to take those on 90 percent of the roadways. Okay.

MR. McCORMICK: The only problem is that according to the Department of Energy, we're going to run out of petroleum reserves worldwide by 2052. So, 40 years from now you might just --

MR. LEONARD: But the whole idea is we're going to have to deal with a mixed fleet for a very long time in

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the introduction of the technology.

I keep coming back to, you know, the public goals that we want to get as we move towards automation.

I was on a panel at Brookings this week where -- and you've heard me say this before. If we implement automation without making progress on fatality reduction, collision reduction, the safety side, the mobility side and the energy and pollutant side, we will have missed the opportunity.

You can picture all kinds of dystopian scenarios where there's self-driving cars everywhere and that -- there's no traffic moving on that bridge, because we haven't implemented the technology in a way that has positive benefits and negatives.

And that, I think, is going to be a big challenge particularly when we try and get to scale.

The other piece of this that I think we have to think about are special needs communities, getting to automation without having wheelchair access, getting, you know, if we don't think about senior citizens, people who have disabilities as you move to this technology, we're going to have a problem.

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There are going to be social equity issues we have to address. There's, you know, emergency response in automated vehicles, you talked about that, you know, but I think there's a very broad range of topics that have to do with research, that have to do with policy, you know, understanding policy and guidance that's going to have to come out, I mentioned a little bit about commercial vehicles, just the implications in terms of the land use and -- there will be job impacts.

So, I don't know how much of that falls under the JPO, but clearly these are things -- mobility on demand, mobility as a service, these things are going to be impacted.

So, I think all of that is -- certainly fits within the broad category of intelligent transportation systems and the research and policy impacts that, by statute, we're asked to look at.

I mean, you could easily look at our entire budget devoted to nothing but automated vehicles, and not have enough resources to address every question.

And that's not going to happen, because there are other parts of this we have to deal with. So, you know -- so, all of the discussion is useful. We're going to have to

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-- we're going to have to focus and make sure that we're addressing the highest priority issues and where we can get -- where we can contribute the most.

MR. CAPP: It's a question of prioritization, not of completeness.

CHAIR WILKERSON: Yes. We'll make sure we -- I've made note of that, you articulated that very well, as we go back in the committee's report in the next meeting, make sure that we've taken those comments into consideration before we make recommendation.

MS. QUIGLEY: Well, what did you summarize?

CHAIR WILKERSON: I'll go through at the end --

MS. QUIGLEY: Oh, okay.

CHAIR WILKERSON: -- just some of the comments he's made about what we should ask and the ITS JPO to do, what's the proper role, how can it support a grand well-developed view to support. So, as we are coming out with these recommendations, we're keeping that in line as we -- before we make submissions.

MS. QUIGLEY: Okay. I'm just going to make one more pitch. Those who are responsible for the infrastructure are intrigued and excited to start deploying

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infrastructure that you need for your connected and autonomous vehicles. We just need to know what that is.

And then we can communicate with our elected officials who do programming of these funds to invest properly.

And with that before we wrap this up -- or when we wrap this up, I just have a fun, little video to show everybody that I've been showing --

CHAIR WILKERSON: We were going to show them at lunchtime.

MS. QUIGLEY: Oh, okay.

CHAIR WILKERSON: Is that okay?

MS. QUIGLEY: Yes, that's fine.

CHAIR WILKERSON: For people to -- if people -- if people have other things they want to share, just let us know. We'll loop them up and we can have a conversation over that.

MS. QUIGLEY: I have two videos.

MR. KISSINGER: Well, I mean, to Tina's point, I mean, that sounds real easy, but we don't have the money to do that.

MS. QUIGLEY: To do what?

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MR. KISSINGER: To implement all these infrastructure upgrades.

PARTICIPANT: Right.

MR. KISSINGER: We simply -- I mean, I'm not saying --

MS. QUIGLEY: Well, we don't even know what that infrastructure --

MR. KISSINGER: -- we can't get it.

MS. QUIGLEY: -- upgrade is yet.

MR. McCORMICK: But your point is --

MS. QUIGLEY: Just tell us what -- is it you want RFID? You want paint markings that have, you know, RFID chips in them along the way? I don't even know what -- I don't know what it is that you need yet.

MR. STEUDLE: So, to answer that, there is a deployment coalition --

MS. QUIGLEY: Okay.

MR. STEUDLE: -- that will get you looped in that's having all those discussions --

MS. QUIGLEY: I love that.

MR. STEUDLE: -- from the infrastructure owners' perspectives, but you're exactly right. We can't prioritize

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because we don't know --

MS. QUIGLEY: We don't know what they need yet.

MR. STEUDLE: -- which piece you need first.

MS. QUIGLEY: Yes.

MR. STEUDLE: That's a lot of the conversation.

And, frankly, a lot of it can be prioritized within the things that we already submit.

MS. QUIGLEY: Yes.

MR. STEUDLE: We upgrade traffic signals every single year.

MS. QUIGLEY: Right. Make sure we're upgrading them correctly.

MR. STEUDLE: The cost of upgrading it with the latest technology is dropping dramatically.

CHAIR WILKERSON: Okay. What's the organization that you recommended?

MS. QUIGLEY: Yes, what is it?

MR. STEUDLE: It's the Vehicle Deployment Coalition.

CHAIR WILKERSON: Okay.

MR. STEUDLE: So, it's the joint between ITE, ITS America and AASHTO.

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CHAIR WILKERSON: Okay. Oh, okay. Got you. I know who -- okay.

MR. STEUDLE: Right. And then there is another group that is dealing with policy side of automated vehicles.

CHAIR WILKERSON: Okay. Great.

MR. STEUDLE: So, that one is dealing with connected, there's other ones dealing with policy issues of automation.

CHAIR WILKERSON: That would be great.

MS. QUIGLEY: Yes.

CHAIR WILKERSON: Steve.

MR. ALBERT: You know, what the Joint Program Office could help with, I think, is this whole lack -- maybe lack of or unknowledgeable of the work that's going on both vertically and horizontally.

I mean, it may -- it may be one state, may be more, aware of what's going on, or one city aware of what's going on, or one local entity going on, but it's not getting vertically in terms of the message getting out about where the resources are.

And it seems to me if Joint Program Office could continue and expand its outreach as well as information

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exchange, that would be something that would be very core to their mission.

I know some of that's going on. I don't know all of what's going on in connected vehicle, but -- and I think this was also raised as a critical point in the US DOT, FHWA funded for what ITS America did -- if I got all the names in there right, politically correct -- was to look at a gap analysis specifically for rural, but also for urban.

And one of the top things that came out of that was the need for greater outreach, greater and better information exchange so that people aren't reinventing the wheel, as Kirk has said, and the right information is getting out to the right number of people.

That's motherhood and apple pie. You can't disagree with it. I dare you.

MR. LEONARD: No, I don't. I'm just trying to think of -- and we do a lot of outreach activities, you know, websites, training. We provide a lot of technical assistance, things we've learned in Ann Arbor, you know, in the first connected vehicle environment that we're feeding back into the other pilot environments.

What I've described for the staff is, we want to

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publish the idiot's guide to how to create a connected vehicle environment. And we're not actually going to publish the document, but we've created a technical assistance network so that people don't have to relearn everything we've learned.

MR. ALBERT: I think, though, an ongoing -- using your idea, an ongoing scan would really be a good thing to do, because things are changing so quickly.

If there were kind of scanning tours or technical assistance centers that could help out, I think you'd be able to accelerate implementation even more.

CHAIR WILKERSON: Any other comments?

Susan and Egan.

MR. SMITH: I think Steve raises a good point. We have a lot of information that we -- or actually provide a lot of information, but it's actually getting folks to be aware that we do have this information and do some more scanning to actually pull in a lot of the information that we don't have.

I think that's where we're going to get the benefit from this is finding out about things that are happening like the video we're going to see at the lunch

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break.

How do we start capturing a lot more data, having it available to folks, and how do we start making sure folks are aware that this information is here and it's available and it's there to kind of guide you and develop in the connected vehicle environment like, you know, this year we had an all-day session at ITS America on a Sunday just talking about how do you develop a connected vehicle environment based on those connected vehicle -- CV pilots, all the different elements of what goes into developing that environment.

So, it's making that information available and also making sure that folks are aware that this is there. That information is there and they can feed back into it.

One of the good things I took away from this is finding a way to use that information to provide a portal that folks can actually feed information into --

CHAIR WILKERSON: That would be great.

MR. SMITH: -- into the internet site so we can start capturing information that way as well.

CHAIR WILKERSON: That's a good idea.

MR. SMITH: That's a really great idea that came

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up this morning.

CHAIR WILKERSON: Susan.

DR. SHAHEEN: This is just a final comment. So, I love this discussion about the gap analysis and, you know, what's missing from the strategic plan, but one of the things that I find a lot is there's a lot of stakeholders that aren't in the room.

And I think if JPO could be more involved in trying to get these stakeholders that are potentially unexpected, again, this comes as the idea of like constantly doing a scan, right, and knowing what is happening.

But in the world that I work in, which is shared mobility, almost every day, you know, I'm becoming aware that I really absolutely have to be talking to developers, because they're trying to figure out how they want to change their parking infrastructure and their development. So, it's kind of marketing strategies they want to do with respect to mobility on demand. They really want to be part of this conversation and they're more or less excluded.

Another entity is like 3D printers. What if we start producing these vehicles, John, you know, onsite, right? So, where is the whole 3D, you know, where is the

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whole 3D community?

So, I think as part of this idea of doing an ongoing scan, being more nimble, it's also, I think, important to be cognizant that we have to be scanning for gaps in stakeholders.

You know, the banking industry, right? There's a lot happening with Bitcoin that's going to factor into this. Where are they in this conversation, in this discussion? I think that will help us to understand where there's even more gaps.

MR. McCORMICK: You know, that's a good point. Mike Duggan, Mayor of Detroit, at the World Mobility Summit, he made the comment that, you know, he said he doesn't know what the reality is of the transportation environment in 10 years.

And it's critical for him, because he just was in the process of approving a parking structure. He says, and he based that on a 30 to 40-year amortization --

DR. SHAHEEN: Absolutely.

MR. McCORMICK: -- to build it back. And he said, "I don't even know that I need it." He said, "I don't even know if I should be building a smaller one or --

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DR. SHAHEEN: Yes.

MR. McCORMICK: -- having remote parking lots or what I should be doing." He said, "No one can tell me that."

DR. SHAHEEN: Well, and what are the role of retailers in a city? Are they even needed anymore? Because that's not what people are spending a lot of time doing is going to the shops. And then we have all this parking infrastructure in front of the shops and the retailers are going to resist potentially removing that parking and granting more access to the curb.

So, you know, there's a -- I think a gap analysis, again, to just reiterate my point, shouldn't just be us prioritizing what we're missing, those of us that are in this room, but what are the industries that we interface with that aren't part of the conversation?

Because every time I have a conversation with one of these industries like the banking industry -- I had a fascinating conversation about Bitcoin a few months ago and I'm realizing, oh, my God, like, this is a whole area that we are not getting which is going to be part of these vehicles.

CHAIR WILKERSON: Right. That came up in one of the futurist presentations I've seen. They talked about

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consumers will no longer go outside to shop, right?

DR. SHAHEEN: Yes.

CHAIR WILKERSON: They will only go to a mall for an experience that they can't get -- no one will ever go to buy -- go to Sears to purchase or to look at --

DR. SHAHEEN: They might not be going to buy milk anymore.

CHAIR WILKERSON: -- a washer and dryer.

DR. SHAHEEN: I know. You see Amazon is doing grocery store now --

CHAIR WILKERSON: So, how do you use that --

DR. SHAHEEN: -- Instacart --

CHAIR WILKERSON: How do you use that space?

DR. SHAHEEN: -- all of this stuff that -- I'm so excited. I mean, as far as you know, I'm ordering my groceries right now. I know. I'm well aware of this.

CHAIR WILKERSON: But it had passed the infrastructure that we are looking at.

DR. SHAHEEN: Yes. I just think transportation is now interfacing in different ways than we've ever experienced before and these new markets are going to be part of our experience.

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So, how does JPO make sure that you're talking to those industries or those stakeholders so that we're maximizing.

CHAIR WILKERSON: Right.

MR. SMITH: And I think you're getting into an area here now where we're talking about the Smart City conversation.

CHAIR WILKERSON: That's exactly right.

MR. SMITH: And the additional stakeholders that we started to identify --

CHAIR WILKERSON: That's a good point.

MR. SMITH: -- based on the work that we started to do the Smart Cities.

CHAIR WILKERSON: That's great.

MR. LEONARD: But also, I mean, I'm just thinking of some of the, you know, the whole deployment tour we did for the last nine months of trying to reach out to entities we thought might be potential, early adopters, you know, the taxicab industry and --

MR. SMITH: Yes.

MR. LEONARD: -- lease -- people who are leasing fleets and large fleet buyers, conversations we've had with

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the post office who's in the midst of a 300,000-vehicle procurement.

To just, I mean, the problem I have is that the list of potential stakeholders is endless. I mean, we've really increased our outreach with the telecommunication industry because we go to TIA on a regular basis, but it's hard -- I'm hard pressed -- just as a side note, I have to go through ethics training every year.

And I happened to take it yesterday. And the conversation with the attorneys about, you know, some -- if you work for the FAA, you cannot own stock in an airline, right? It's just one of those prohibitions they put in to keep the ethics piece clean.

And Federal Highways has not done that yet. And I said, you know, in the ITS, it's a challenge, because I'm hard pressed not to find an entity that there is a potential connection --

DR. SHAHEEN: Well, that might change with the new administration.

MR. McCORMICK: I'm curious why you have to be retrained on ethics every year.

MR. LEONARD: Apparently I'm a slow learner.

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DR. SHAHEEN: The conflict of interest thing might change.

MR. McCORMICK: I mean, are they changing?

DR. SHAHEEN: But can they -- maybe part of it is the same thing we're talking about with the gaps between connectivity and EVs, is we prioritize which of those industries you really need to be talking --

CHAIR WILKERSON: I think that's exactly it. That's a great point.

MR. SMITH: Yes, and that's a great point. In fact, that's why we started to develop the -- we started an initial schematic of the stakeholders --

DR. SHAHEEN: Yes.

MR. SMITH: -- and their relationship to the JPO to try to look at the different levels of stakeholders that we had.

DR. SHAHEEN: Right.

MR. SMITH: But I think that's where Ken got a little bit agitated because there was just so many stakeholders that were on that -- on that document.

DR. SHAHEEN: But there's going to be different players, right?

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MR. SMITH: Yes. Yes.

DR. SHAHEEN: But the developers are massive, so we've got to be talking to them, right?

MR. STEUDLE: But the developers are different all over the entire country. The developers in San Francisco are different than the developers in Los Angeles, versus New York, versus Detroit versus Cleveland. You'll never get to -- you can spend every day on the road and never get to all of them.

MR. LEONARD: It is not monolithic. I mean, that's the problem. There's so many different groups.

And I -- I mean, we can share our event calendar and maybe this is a little off this topic and more to the point you were making earlier about, are we doing the right kind of outreach in stakeholder engagement?

MR. LEONARD: I think, you know, that is a topic in which I would welcome input from the group. But I think if we were going to have that discussion, we should share with you what we --

DR. SHAHEEN: Yes. That would be fascinating.

MR. LEONARD: -- the kinds of outreach we've done in the last couple years and we could have a discussion about

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why we chose some of those groups.

And it's not just the presentations and meetings that we've had with JPO. We also fund other people in the Department to go out and carry messages, you know.

And like I said, the champion, you know, message carrier for the last couple years has been the Secretary. It's -- I was so excited at TRB last year when he gets up and talks about his top five programs and the top three are ours, you know.

So, that's -- I know we're getting our messages out there, but there's still a lot -- there's a lot more we could do and I don't know --

DR. SHAHEEN: Well, it's just because -- it's not that you're doing anything wrong, it's that the world is changing so fast that new players are entering that we didn't have to really worry about before.

But I think if you're going to create a connected/automated world, where are those connections that we need to have to those other industries that maybe weren't at the table before?

MR. SCHROMSKY: So, one of the things --

DR. SHAHEEN: I'm not trying to overwhelm you,

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I'm just --

CHAIR WILKERSON: No, but I think that's a task that they're asking us to take a look at.

DR. SHAHEEN: Yes.

MR. SCHROMSKY: Well, one of the things that we do -- because we can't foresee everything.

DR. SHAHEEN: No.

MR. SCHROMSKY: We have no idea what the next device is going to be. I mean, we have ideas for the smartphones, but the next connected device, we have no idea.

And one of the things that we do, which I look to JPO to kind of -- we have a framework, right? We have what is open development initiative. I mentioned it before.

So, we basically look at layers one -- of the OSI model, we really check on one, two and three. To some extent three, but mostly one and two.

Meaning if you want to build a place, Raj at Carnegie Mellon and his student body comes up and they want to get a device certified on our network, we'll certify it. We'll verify the radio piece, whatever it may be.

Everything above that all the way up to the application, I have no control over. But I have to make sure

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that whatever he develops doesn't adversely affect this device, whatever it may be.

And I think that's where -- because I can't foresee everything, right, that I think that we're all asking, what's that framework, right? Because we've seen in other industries because if you look at -- if you look at cyber security, right, some --

CHAIR WILKERSON: That's a good example.

MR. SCHROMSKY: -- it's unintentional bad actors meaning that if you make a baby monitor that was used for a denial of service attack recently in Boston, right? Shut down websites. Why? Because they were lazy enough that they used a very common encryption key and they used "password1," right, as their password to everything.

Somebody hacked it and, in turn, reversed it, right? So, you know, there's things that we do, right?

It's annoying that some people don't like when they come over and visit, my FIOS password is very unique, very -- ten digits. Well, it's in our best interest to do that, because we don't want it coming back on us.

And I think one of the things that we look at JPO to kind of say is knowing that you can't control everything,

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have influence and there's going to be multilevel, there has to be a common framework around communication, a common framework around security. Here is something as simple as best practices that there's going to be new outlets.

And I think that's what I think we're all -- it is a lot less. We're just reacting, going as fast as we can. But fundamentally if you look at IP, there are standards out there written that says, hey, we need to do this, put them in a block

So, I think that's what we're asking, really, to say what would that be, right? What recommendations or what would you -- if it comes to coms, if it comes to bits, 128 bits, I mean, this does this pretty well.

MR. LEONARD: You know, the example you're giving is a perfect one. I was speaking at a Transit Conference and -- I don't know those of you who know Mike Denning who's the cyber security guy at Volpe, happened to be in the audience.

And I got asked a question and -- about cyber security and what we were doing with connected vehicles. And I gave exactly the answer you gave which was, you kind of have to have end-to-end cyber hygiene and you can't have password1.

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And I'm shocked you only have 10 characters. I use 32 characters and it drives people nuts when they come over and have to add those 32 random characters in.

MR. McCORMICK: Oh, I have an easier way to do it. I just call the wireless access point "FBI Listening Post No. 1" and --

MR. LEONARD: There you go.

MR. McCORMICK: -- no one logs onto it.

MR. LEONARD: But so, you know, so the cyber security piece is one thing. Connecting, you know, a part of ITS and I've had conversations with kind of the ZipCar community and the people who are doing the data analytics on transportation and food deserts and recognizing that they need to talk, because to solve, you know, ZipCar wants to be -- have their cars on K Street. And the city is saying, well, but we also need some in southeast where, you know, where there's a large population that's unbanked.

So, you get to, well, how are you going to solve this issue where it's a transportation problem, it's a social services problem, and how are you going to bring all of these forces together?

And so it's -- I kind of draw the line at a certain

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point. I can't be out going to community banks and saying, okay, I think you guys are the missing piece in this, but I do think that's appropriate for the stakeholders to recognize if they want to solve their problem, it's not just ZipCar in the city or it's not just the data analytics people saying, hey, you've got a problem here. They have to recognize that there are multi-disciplinary stakeholders they have to bring in.

And, I mean, I --

DR. SHAHEEN: Well, maybe it's like we were saying. It's going back to that Smart Cities framework that was initially connected was the idea that cities are connected or people are connected. And it's not actually cities, but could be rural areas or communities, right?

But maybe that's what it is, but I think just -- I think being more cognizant that because things are moving so quickly, that there's going to be new stakeholders that aren't plugged in.

MR. SMITH: And it's also starting to work with some of the stakeholders themselves and have them make the additional connections for you.

That's one of the things we try to do in Columbus

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in particular is work closely with the -- for example, the MPO that's been there for a long time and they were sort of the basis for that proposal, utilizing their knowledge to reach and pull in these other stakeholders that need to be part of the conversation.

CHAIR WILKERSON: And give you some flexibility in your budget and structure so that you can be nimble and respond to this changing environment.

MR. LEONARD: But you also realize in a place like Columbus where electrification is part of what we're doing, but now one of the key partners is the local utility.

And so, we are -- we're crossing -- from a federal perspective, we're crossing multi-departmental boundaries. And so, in fact, I'm working on a multi-departmental group and we had exactly the same issue you raised, which is we wanted to get away from -- and this is almost heresy is the group that's behind Smart City, but we wanted to get away from Smart City, to Smart Cities and Communities, recognizing that it's not just the city environment.

The rural and suburban environments also need to take advantage of the kind of technology -- and I do think we picked the right model with Smart City, in picking those

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mid-sized cities -- and Steve and I were talking about this earlier -- because there are pieces of what we will learn there that will be scalable up to the mega cities and scalable down to the less dense environments, the rural environments, and some won't.

Some will be unique to each of those environments, but it was a good place for us to start and, you know.

DR. SHAHEEN: But with this next administration, do you guys have a sense -- anything about Smart Cities? Is that something that can be carried forward?

MR. LEONARD: I don't have a sense. What I can tell you is that we have been preparing for a transition for some time. We have presented briefing papers and -- prepared briefing papers and slides.

And my intention with the new administration is that the first opportunity I get to go in -- and we were just -- we were just updating documents this week about what our key issues are.

Now, as you can imagine, one of the key issues is the NPRM and the rulemaking and the spectrum issue. I think that's a hot button issue that somebody needs to know about on January 21st when they walk in.

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Cyber security is another issue that we raised as a hot button issue. And we're going to talk to them about our portfolio.

I don't know a lot about the incoming administration's position on infrastructure other than what I've heard publicly, which is, is a big belief that we have to invest in infrastructure. That makes me, you know, I have a positive response to that.

And, you know, we have an incoming Secretary nominee who is an experienced executive both in transportation and in other parts of the Federal Government, and who's an economist. You got to love that. I love that.

So, I see encouraging signs, but I know none of the specific -- haven't heard a lot of specifics around does this administration recognize that -- and the quote I remember hearing president-elect Trump say was he wants to invest in infrastructure, and he wants American infrastructure to be better, you know, the best in the world.

I don't know if that translates into an appreciation that that has to be an intelligent infrastructure. But if you're looking at the rest of the world, if you're looking at China and you're looking at

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Europe, you will recognize that Intelligent Transportation Systems and Smart Cities is a tremendous growth opportunity.

And so, I hope that those technologies will be embraced. And certainly the JPO intends to communicate what we see as the value, and then we will follow whatever guidance and direction we get out of the new administration. And it's not written yet, so we'll have to see.

MR. SCHROMSKY: Cyber is the one -- I mean, one of the things we're seeing now -- and, Kirk, you may have missed this -- a lot of the sensors they're using for DOT today are all antiquated infrastructure. Old TMA, old analog.

And what we're seeing -- and we're working on big projects with the FAA. We're doing right now -- these are all radar sites. These are low baud rate, 2.4 kilobits. I mean, this is -- but the sensor technology in the mission works just fine, right? It's the comm piece that's just going away.

And, you know, there's no air gap issues, it's a hard line. But once you start putting in your LTE or some other technology and refer to that to IP, a lot of the facilities and -- I call it dirty jobs with Mike Rowe. Once you do that, what do you mean? I just plugged in something.

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What do you mean I need a security certificate? Then, you know, this vector is going to explode.

And I'm curious if JPO really on the cyber piece that I think a lot of people don't realize, we just decommissioned. The TelCos are not providing this TMA low bandwidth connectivity that, you know, this is critical infrastructure.

But when you ingest new technology, it just brings in everything else out there. It's, you know, it's not connected like your laptop and you have all these firewalls and different security layers and everything else. It's a remote sensor that's counting vehicles or digital signage and all of a sudden now it's IP, you know, I'm really curious -- I think cyber should be a big focal point for JPO going into -- because, I mean, everything has to - it's all about cyber security now.

MR. LEONARD: And as you're aware, our cyber focus at least for the last two years, has been on the SCMS, the Security Certificate Management System.

MR. SCHROMSKY: Yes.

MR. LEONARD: And, unfortunately, and I know I've briefed this group on this before, as we accelerated both the

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Smart City pilots -- I'm sorry, the connected vehicle pilots and the Smart City program, one of the areas we had to draw resources from was our cyber program and also our automation program.

So, you know, we're dealing with those budget priorities and they, you know, budgets have consequences and we are not funding as much in cyber security as I believe we should because, let's face it, at its core -- I mean, we're talking about the coolest technology in the world, right, ITS, but at its core, it is information technology that is moving data and it's communications, and it's sensors, it is -- it's basically we're an IT shop and it's not investing enough in understanding the IT side of things and the data management side.

And so, because there are other applied transportation issues we're trying to champion right now, we've got to make sure we strengthen that IT core of intelligent transportation systems.

CHAIR WILKERSON: Okay. Well, thank you. That was a really good discussion. We will break for lunch.

(Off record comments.)

CHAIR WILKERSON: And then we'll come -- we'll

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have a working lunch. And then during -- well, not a working lunch, but we'll hopefully eat here and then there are -- a couple of the members have a few links they would like to show on -- or video which we will just show.

And if you have other things you'd like to share or other -- during this 30 -- 25 minutes or 30 minutes we have for lunch, let us know. So, thank you.

And then we'll move to -- rural development is next. Okay.

(Whereupon, the above-entitled matter went off the record at 12:03 p.m. and resumed at 12:42 p.m.)

MS. QUIGLEY: All right, this is a video that I use that I share with, whenever I'm doing public speaking in front of elected officials or business stakeholders, urban planners, to help them understand that some of the decisions we are making right now we need to be considering to make sure that it complies with the future of urban planning.

And the audio's really bad but it's a cute video.

(Video played.)

MS. QUIGLEY: All righty. So we'll turn now to Rural Development Assistance with Steve.

MR. ALBERT: You know, that's a hard act to --

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MS. QUIGLEY: And Bryan.

MR. ALBERT: I guess for the last 10, 12 years of being on this committee I've been the rural guy. And every year or every time we meet someone usually ends up saying, You know, we really need to understand what the rural issues are, what it's logistics are, how bad is it, how does it differentiate between urban versus rural.

And so the rural guy this time was asked to put something together. I didn't want to do a PowerPoint presentation, and I'm not going to. But I think what might make sense is for you to kind of thumb through this document, which is -- yes, no, no, wait a minute. Don't get me there yet. It's an overview of the conference or summit that we had this summer in September on a national working summit in transportation.

It was, as you can see from this, it was three days, 10 discussion topics, and a white paper. I think what made this so unique, and a number of people who have highlighted this issue, is we brought everyone to the table, even when you thought they didn't have anything to offer. But whether it was the economic development officer from an area, or whether it was a fire chief, or whether it was county

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engineers, it was a pretty diverse group, as you can see in a pie chart that's in this presentation.

I didn't want to present something that was just my thinking. And so I thought it was important to maybe walk through this a little bit, up to about the fifth page. And you can see what the goals of the summit are. And the sponsors were the National Center for Rural Road Safety, which is the FHWA Center of Excellence that I also direct; AASHTO; NACo; NACO and all the other alphabet soup organizations provided sponsorship or were on the steering committee to get the right people to the table.

And I think that table issue is really so important. We had pretty diverse folks, as well as public health, CDC, Center for Disease Control, came down and did a speech, as well as other groups from ITS America, as you can see.

We had about 115 people. You can see the pie chart for diversity.

For what some of the statistics are, and I'm going through this quickly. I'm on page 5 now at the top. And I don't think people really, when they think of rural they don't think of it as being safe or unsafe. But when you think that

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60 percent of all fatalities happen in rural areas, all we ever hear about is urban, urban, urban for the most part, but really where the safety actually is a greater issue is in rural America, and specifically on those two-lane roads.

So some of the statistics that are here. Roughly two-thirds of the nation's 3,000 counties are considered rural. 45, they represent 45 percent of the nation's roadways. They own 39 percent of the nation's bridge inventory. And there are some real disparities between motor vehicle crashes. And you can see what that says.

But the bottom line is you're two-and-a-half times more likely to get killed in a rural environment than you are in an urban environment. And you may say, why? A lot of it is to unforgiving roadways. Running off the road, you may or may not be found, as an example.

It takes twice as long to get response to a crash. And there are many other statistics in here. I'm not going to go through all these. You're welcome to read, read through them. I think you might find them a little bit eye-opening. We will be producing a white paper that will help define kind of the next steps for what real programmatic funding might look like and what it might address. And this

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will be working with the National Association of County Engineers.

So the next thing that I have is this rural deployment assistance. What I tried to do is to put something that spells out an overview, kind of a background, a statement of what the problems are, what assistance might look like.

CHAIR WILKERSON: That wasn't circulated.

MR. ALBERT: What's that?

CHAIR WILKERSON: We don't have that.

MR. ALBERT: You don't have this one?

CHAIR WILKERSON: No.

MR. ALBERT: Well, that's not good. No wonder.

Steve, didn't you print these?

STEVE: Did you send it to me?

MR. ALBERT: Yes, oh yes. And by the way guys, I also sent this out electronically to you.

CHAIR WILKERSON: Yes, we have it online.

MR. ALBERT: Yes, it was -- but I also copied, I think, everyone in the committee.

CHAIR WILKERSON: Yes. We got it online.

MR. ALBERT: Okay. I'm old fashioned. I'm

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sorry.

CHAIR WILKERSON: That's okay.

MR. ALBERT: I don't know if you can pull those up or not if you have them. That makes this much more difficult though.

Yes, maybe put it up there.

(Pause.)

MR. ALBERT: So while they're pulling that up why don't I just go ahead and kind of walk you through this and then we can discuss it when the recommendations come up.

So I kind of laid this out as I can see fit.

CHAIR WILKERSON: Can I ask you a question?
Pardon me.

I know you sent something on rural assistance deployment program back in September.

MR. ALBERT: Yes, that's it.

CHAIR WILKERSON: That's the one?

MR. ALBERT: That's it. I haven't worked on it since then.

CHAIR WILKERSON: So there were two: one on 9/13 and 9/20. People were just looking for the date.

MR. ALBERT: I think one of the things we've

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learned in ITS is you're not going to get something on a big scale going unless you provide some seed funding. And seed helps germinate a lot of different things. And I think that's what we're seeing also in the Smart Cities Program or Smart Cities and Communities in the future. I think it really helps when seed money is provided.

And so what I tried to do was to outline something here that would provide an introduction so people will say, why, how bad is the problem?

And also then, what might assistance look like? Some being provided to fund more ITS and pilot projects in rural areas that then will jump start. I doesn't have to be a lot of money, but I think money needs to be brought to the table, to address safety or mobility or freight or infrastructure.

And I think the same thing could be said for autonomous and connected vehicles and doing pilot projects in small urban or rural areas. Or I think even what's going to happen quicker is even working on university campuses because they're pretty self, self-motivated, quite frankly.

So, the things that I thought were important in looking at funding were also who might distribute this

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funding. And I don't know if something like this would be feasible. And the National Association of County Officials would be a very good one, getting it down to the local level.

I do know John Horsley had meetings with Secretary Fox previously about \$20 million being allocated to counties. And it seems like that could be good seed money to do maybe ITS efforts on county roads.

George, you can jump in any time you want, or Kirk, Bruce. Yes, going in the right direction? This is a lot harder when you don't have, when your audience doesn't have the material in front of them.

So I thought what could be done with some of that seed money was to identify critical transportation challenges, where technology might be used, to have identification and coordination of the federal, state and local resources that could be leveraged. And then identify some prioritization and selection of pilot projects that might be able to go in. Maybe just kind of being low hanging fruit.

So those were some of the initial ideas. At least I see that the benefits could have been providing more technological deployment and peer assistance. I think a lot

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of things that happened, and why maybe some people feel there's things that are just reinventions, is that everyone starts not necessarily from the same place. And if there was a peer-to-peer program for rural ITS or rural connected vehicles, that might help it accelerate as well.

And I think the peer-to-peer program worked well many years ago through Joint Program Office and should be considered.

So this wasn't the presentation I was expecting. I was expecting to have more of a crutch because you'd all have this stuff in front of you. But now knowing that you don't and we'll have that up on the screen.

Any, any general reactions to what has been written, even though you don't have it?

(Laughter.)

MR. SCHROMSKY: So some things, and one of the reasons why, in talking to Steve or this committee, personally for me, and my organization represents, we see huge potential when it comes to rural areas. So if you look at IoT, and everybody talks about IoT, you could talk to Verizon, you could talk to Amazon or Google, one of the main pillars when you go to IoT is farming or agriculture.

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And when you look at agriculture and farming they're not anywhere you see outside this window, it is in rural areas. And you look at agri-business, they've been doing a lot of connected vehicles and combines and different technology and been using it for years.

MR. ALBERT: Yes.

MR. SCHROMSKY: That a lot of the technology that's actually been developed in rural areas, and taking some of that knowledge and actually incorporating it into city and urban centers out there which I think gets overlooked in a lot of cases.

At least for us, you know, coming back to that earlier comment, how do you provide connectivity in those rural areas out there; right? In a lot of cases you'll see satellite providers, wireless communications are the preferred method because that's the only method you can get out there, compared to infrastructure here in urban areas.

Some other statistics near and dear to my heart, if you talk about sovereign nations and tribal, --

MR. ALBERT: Yes.

MR. SCHROMSKY: -- you are eight times more likely to be in a traffic accident compared to non-Hispanic

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whites if you are Native American. And it's the third largest cause of death on reservations and in the sovereign nation lands as well, so.

MR. ALBERT: It's usually four to eight times higher death rate on tribal lands than white, in any state you go.

MR. SCHROMSKY: Yes. So high mortality.

And I also looked, and we talked about economics in our earlier discussion, one question I wrote to JPO, and Ken in particular, is if you look at the economics, I think the only thing you have is to use technology to serve, you know, a vast majority of individuals in remote areas. You just don't have the band width, actually, so you're forced to use technology. An example would be, as we hear a helicopter go over, we see it in a lot of places.

I don't have funding. Or a Sheriff's Department might have a helicopter. For a fraction of that I can maybe have 40 drones to do search and respond and drop medical care, you know, and I can't have an ambulance out there wherever it may be.

So one of the things I think we have to look at in rural: wide open spaces, less regulation to some extent,

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and more green field to actually do some things, particularly because it's of interest as well. And it's eye-opening when you start working on the rural places and you start looking, especially agri-business. Very interesting.

You know, if you go into truck platooning, right, you talk about transferring information. National security, food supply, very hot topics right now. A lot of discussion about that, how do I verify that different things out there. And I think, you know, over rural how you transport that, it's critical infrastructure.

But, you know, what was ultimately eye-opening to me, and especially when I looked at the sovereign nations and how high that is. It was pretty, pretty dramatic.

MR. ALBERT: Can I jump in here for a second.

MR. SCHROMSKY: Yes, please.

MR. ALBERT: You know, I think it was either a cruel intention or a cruel joke, or it just happened to be that we've matched someone to me from Montana and someone from New York/New Jersey area.

MR. SCHROMSKY: Yes. Afraid so.

MR. ALBERT: And both believe that, you know, rural America really needs to be addressed.

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You know, it's, it's really amazing that we continually, as a nation, continually put money on our interstate roadways and not so much on the two-lane rural highways, where drivers using two-lane rural highways are four times likely to die. Not on the interstate. The interstate is very, very safe. I know it's higher volume, but it's much safer.

And if we're trying to reach toward zero deaths and we're not, we're not putting things on the two-lane roads, will we ever really achieve the mark? I mean two-lane roads are very, very dangerous, especially these that are, you know, winding and hilly and everything else.

You know, one of the opportunities that I've always -- and we know there are challenges in connected vehicles with fleet penetration being difficult, lack of communication. Maybe some of the technologies don't work, like in snow, if they're video image processing systems, et cetera. But I've always thought one of the areas that isn't talked about very much -- and of course I've written an earmark on this -- but is the idea of connected vehicles and our national parks or federal lands, which are being loved to death.

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And Yellowstone's numbers went up another 25, 30 percent this year. Now it's 4 million a year -- 4 million, basically for the summer, of visitations.

But if you could put someone in a connected vehicle somewhere like Yellowstone National Park, then it helps the visitor experience. It helps protect resources. It helps manage supply and demand. I think that would be a really cool place and something that people then would bring that message home and say we need to be doing more of this kind of stuff in our hometown.

Tourism is the second leading economic indicator, of anything in rural America, it's the key thing. Less than agriculture, less than resources, it's tourism that's the big money maker. And if you could apply connected vehicle technologies relating to tourism, that's a win/win for everyone. Because usually if you maintain someone's presence in a state for one more day, it is millions of dollars generated.

MR. SCHROMSKY: Actually, speaking of that, there was a study recently -- not a study, a story recently, I believe on the Today Show and NBC News where they talk about, you know, like rural Colorado, if forget the name of the town,

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but kind of on the idea of smart lighting or smart cities where they actually reduced their illumination upward.

PARTICIPANT: Dark Skies.

MR. ALBERT: Dark Skies, yes.

MR. SCHROMSKY: Dark Skies. And actually to your point, the tourism is skyrocketing.

MR. ALBERT: It's huge.

MR. SCHROMSKY: Because they've actually used smart technology to reduce illumination. Using the same technologies in the smart cities, I would say are a facet of that I guess the question I have of JPO, as the awards went out to the Smart City Challenge, as you mentioned, right, for example the Zip Car, right. I think one of the things that gets overlooked a lot is all the technologies that have been updated. A lot of procurement laws have not been updated. Right? I mean it's, if I was running a city it would be very easy to get Zip Car. Do you want the franchise, you're going to have to mandate there so many allocated, they're going to be at these locations. If they want to bid on it, they'll bid on it.

The question I would have also for the Smart Cities, the technology that will be used in the Smart Cities,

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is there a kicker/mandates that, hey, a percentage of that money or monies in the future, can you take that technology that we're giving you that you do put in rural areas? Right? Because a lot of times they might not have the infrastructure or resources to develop or compete or write a good RFP, but they could leverage whatever's being done there, if it's lighting or if it's signage, whatever it may be that you could, you know, kill two birds with one stone.

If it works for a city proper or county, parts of that county would be rural that you could apply it as well.

Question?

MR. LEONARD: Well, we certainly envisioned that the technology could be developed for Smart City applications. Some might be applicable to rural areas. We did not specifically put into the solicitation that there was a mandatory requirement to transfer to rural.

MR. SCHROMSKY: Okay.

MR. LEONARD: It more we put in some mandatory technology transfer but we didn't specify what it would go to.

MR. SCHROMSKY: Okay.

MR. LEONARD: We put in mandatory outreach so

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that there was communication about what is warranted but we didn't identify outreach mechanisms or we didn't say you have to have transfer to rural communities or megacities or anything like that.

MR. McCORMICK: Steve, one of the things that I wanted to talk about is that we have an adoption rate issue. We replace 6.7 percent of our cars every year. And so it's going to take a while before --

MR. ALBERT: Fifteen to 20 years.

MR. McCORMICK: -- everyone has the capability and technology.

The Indian government brought me over because they said, you know how our government works, we'll never create a vision for safe, efficient transportation. But even with the universities and the commercial entities and the right public entities involved, maybe we can craft a vision that takes us forward.

Now, this is an environment when you're driving down a six-lane boulevard it's not just cars and trucks and motorcycles or "tuk tuks," you also have at every crossing, intersection, turnaround, hundreds possibly of beggars. Because half the population is below the poverty line.

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You also have hoards of -- herds of water buffalos going to and from the river in the morning and the evening on that nearly expressway. You have troops of monkeys along the sides in some sections of it.

And at one point I passed a camel. The camel was in the fast lane. And I asked the guy next to me, I said, there's a camel on your expressway. And he goes, yes, we have a very egalitarian transportation system. This all works in the rural areas because we also have elephants.

MR. ALBERT: I noted elephants two weeks ago in India, or at least staff did.

So we have issues relating to wildlife and transportation --

MR. McCORMICK: Yes.

MR. ALBERT: -- in 17 countries.

MR. McCORMICK: And I'm getting to that.

And then when you look at the communications capabilities, the best you're going to get is 3G. And they're not able to deploy something like DSRC.

MR. ALBERT: Yes.

MR. McCORMICK: And they're not like China that says, I'm going to try to leapfrog it by doing some DSRC and

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going straight to 5G.

That was in January. And then several months later I was in Morocco. And in Casablanca and down the coast it's -- and it's not like the movies, just so you know. It's just a dirty North African industrial town. But they have the same, identical issues. So that whatever you would do in India would directly make sense over there.

And they have a lot of the same problems that you described in this paper, not just the rural areas but in their cities as well, because there's not a differentiation of the transportation ecosystem like we have between rural and urban. You know, somebody driving a tractor is not going to do it down here.

MR. ALBERT: Right.

MR. McCORMICK: Right. And so when I look at the question, rather than saying how do I force the technology that we have to try to create a solution, because you don't have backhauls here to stop in the middle of the rural areas, the question really comes back to say, and because of the adoption problem you don't get those benefits. And, you know, Ken and I had talked a couple years ago and said when you broadcast a DSRC signal you're also broadcasting 4G.

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Because that may not help the guy right behind you if you're on ice, or coming, the next car coming at you --

MR. ALBERT: Right.

MR. McCORMICK: -- but within 20 or 50 milliseconds, depending how long the signal's going to take to get there, it could inform you here. And that may be good enough to at least prevent, you know, the pile-up or collision or whatever.

And when I look at the possibility of what you have to do in Africa or sub-Saharan, the same problems in Kenya, or in India, or in rural areas, it's that waiting for GM, or anybody that can get this technology in cars, you're going to take 15 years before it actually percolates into the countryside.

MR. ALBERT: So everything is the OEMs?

MR. McCORMICK: Yes. But if you can do it and somehow leverage that tool, that phone in the car -- and it doesn't even have to be that smart of a phone -- so that there may be ways to get some advantages of poor knowledge of road, weather and traffic conditions, not necessarily instantaneously in front of you, but possibly within a near enough time for most of the people.

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And as somebody observed once a few years ago when we were working in CAMP, he said there's a lot of things you can do to inform the drivers and others at an intersection that somebody's going to violate it without communicating with the cars.

So we don't have to always have that technology that's on, that we're working advance this longer picture.

MR. ALBERT: Right.

MR. McCORMICK: But we shouldn't be looking at the "what else can we do?" rather than saying, "How am I going to adopt DSRC and place that in the countryside? How am I going to solve my actual issue?"

MR. SCHROMSKY: One of the things I think on the technology piece -- and this came out, Scott, last week, you know, a lot of people put a lot of hope and prayer into 5G; right? And I think one of the things about 5G, what people don't realize, standards are still being written. It hasn't been deployed.

How big is the coverage going to be? And I think it's going to take some time because we have to prove it out with the business models.

To those points, or something just on the rural

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place in technology, we have a program that we launched, it's called LRA, or LTE Rural Access. So there's actually 23 partners right now that are signed up. So these regional carriers -- I'll pick one from my alma mater, Bluegrass Cellular.

So you're talking about Appalachia, down there, down near Fort Knox, rural areas. That carrier could actually deploy the LTE, will share the IMS core to some extent. And actually their home network will be the Verizon network and vice versa. But I know in these rural area, that will be an extension of my network.

So we have 23 partners. And adding new ones on there to kind of grow that footprint. That's just on current 4G.

I think one of the things that we look at in DSRC, there's a couple ways that you do that. Because V2V, tons of vehicles going back and forth, I don't need cellular, I just can have a certain frequency radio going back and forth.

I think what we look at a lot of times in current infrastructure would probably satisfy 90 percent. Right? If you're looking at smart lighting, smart traffic, very low band width intensive that you're just little ones and zeros,

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turn red, turn green, whatever it may be. That you'll find out whether on CDMA or even GSM to some extent, there's coverage that's going to satisfy most of those areas out there.

But I hesitate saying that, you know, 4G is pretty well covered. And what we're doing through our partners and what the other carriers are doing it's pretty well blanketed. You know, it covers a lot of rural areas. Like, for instance, here in Maryland, we covered Garrett, Allegany and Washington Counties which we never had coverage before because it's 700 megahertz.

The other thing that could be possible, is you can lease spectrum from a carrier to provide if you need it. But I want to -- a lot of people get hung up on the speeds. I will tell you, for what you're looking to do with the lower latency, true autonomous vehicles, I can see it.

But, for instance, if you are using DSRC, V2V, or V2I, and use that local frequency, we're going back to cyber, where that connectivity might come in place would be, okay, I want the vehicle to come to me and I have to transmit and tell him my location to come get me.

Or, if I want to pull the cert off of that device

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and disable that infrastructure, I've got to go out there and reach it out there. So I don't necessarily -- I can do that today on 3G and it gets a little bit better on 4G. I think 5G, when we look at that, really the speeds are great but it's really the latency of anything that you're really fixing. The speeds don't really help.

MR. McCORMICK: Well, I witnessed this latency test from point to point in Shenzhen. It was less than one millisecond.

MR. SCHROMSKY: Yes. I mean you can do that there. But that's a controlled environment. And people, there's other things that --

MR. ALBERT: So, guys, what does that mean for this recommendation.

MR. SCHROMSKY: I mean, I think what the point is, there are a lot of technologies. The networks are there. You can do some of this stuff.

I don't -- there shouldn't be a hesitation to develop it, waiting for a faster speed and faster network. The technology exists --

MR. ALBERT: Isn't it a natural migration path anyway?

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MR. SCHROMSKY: It is a natural migration. Technology exists today to make it happen.

MR. McCORMICK: The question is for the JPO is that, given that those statistics are significant, how could JPO allocate its resources and activities to servicing that, that need.

MR. LEONARD: So we've talked about it already today. And this great opportunity that exists is the ATCMTD grant program. We're putting \$21 million a year, joined by \$39 million of other Federal Highways R&D money, into no fewer than five but no more than ten awards. They're capped at \$12 million, a maximum of \$12 million. We put out eight this year.

They have to be, by statute, technologically and geographically diverse. Which just tells me that at some point your number is going to come up as a rural community; right?

MR. ALBERT: And what's it called again?

MR. LEONARD: The Section 6004 grants of the FAST Act.

MR. ALBERT: Okay.

MR. LEONARD: ATCMTD advanced -- Let's not get

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into that.

PROFESSOR RAJKUMAR: Advanced Transportation and Congestion Management Technologies Deployment.

MR. ALBERT: Okay.

MR. LEONARD: But section -- Google Section 6004 of the FAST Act. That will identify it. It's a relatively short section of the statute that will give you the breadth of these grants.

Now, every year what we do, what we did last year, what we're in the process of getting ready to do this year, and we'll do three more times after that, is we put our specific focus areas. This is what, you know, DOT is looking at as a focus area this year. But it doesn't exclude anything that fits broadly under the category of that statute.

And one of the things over time we will be looking for is to make sure that we are hitting the broad nature of that statute, both technologically and geographically placed.

And so currently, rural fits into that geographic diversity.

MR. ALBERT: Okay.

MR. LEONARD: But the burden then becomes you now

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have to assemble a compelling proposal because you will be competing, you know, with others.

MR. ALBERT: We're used to that.

MR. LEONARD: There you go.

Kirk?

MR. STEUDLE: So every Wednesday I get the statistics on traffic fatalities. And we now have exceeded last year's total number, and it's the beginning of December. Your comment is spot on: two-thirds of them are on rural roads. A lot of them are on state highways as well.

I think if there's one thing that this committee could do is to propose to JPO that they put the spotlight on the fact that you're killing more people there, and do something with the deployment grant that targets this area. Something similar as to what we did with Smart Cities. Smart Cities put a light on it. Last I checked recently, there's kind of a lot of interest in rural America, and maybe the new administration might really like that idea.

But -- and I've said this for a long time to many of you, that if we want to make ITS sell, we have to figure out how it sells in rural America, because that's where the problems are. And it's in the state legislatures that way.

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It's in, now it's the Federal Government that way. And when we make that pitch, "here's how it fits," then the urban areas will come along.

I mean, if you just think about it broadly, keep it for this group, but if ITS works in the rural areas it's going to get much more Congressional support. And it will make it a whole lot easier for the US DOT to continue.

I think even a recommendation that says JPO should consider taking some of that deployment grant and specifically look for rural solutions instead of just letting it compete with everything else. Because just letting it compete, it's not going to do well.

MR. ALBERT: No.

MR. STEUDLE: The resources at all the universities are in urban areas. And we've got to get the university that's in the rural area, the urban area that's going to go to the rural area and help solve that problem. That's where we're killing 20 out of the 30 thousand people a year.

MR. ALBERT: Hear, hear.

MR. LEONARD: Kirk, if I could, one of the key things that you said there is that ITS is going to work in

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the rural areas. This is why a proposal has to be pointed at an effective ITS solution.

If what's killing people in that rural area is impaired driving, ITS may not be the solution.

If it's bad road condition, ITS may not be the solution.

If it's run off roads, you know, with --

MR. STEUDLE: And that would probably be it.

MR. LEONARD: But, well, no, I want to say this. There are potential ITS solutions, and you need to make sure that what you don't want to say is we're going to solve the rural fatality problem. We've got this idea, just go ahead and deploy it, and not have it actually address the problem.

If it doesn't work in the rural areas you will lose support for ITS by saying you sold us a bill of goods. You tried to solve the wrong problem with the wrong technology. And that, that would be bad for us.

MR. ALBERT: I hear you.

MR. STEUDLE: I would agree with that. To the extent, though, that the Smart Cities piece had a whole different look away from just technology and says let's put a smart phone in core areas of the city because that will solve

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another problem, that's the kind of thinking that has to go back into the rural piece as what are you trying to solve?

And I agree with you, it has to work. But I think the focus and assistance from the JPO to say, think about rural areas and how could you? Because we had that, lots of conversation about the rural, about the urban areas. And I've been parts of lots of this.

But even a conversation that was, well now, how do you address that drunk driving, run off the road, whatever, and how does technology help that?

MR. ALBERT: It does seem a little unfair. And I'm maybe looking backwards here. We have had corridor programs. We have metropolitan programs. We have Smart Cities now.

And as soon as we start this, historically happens, as soon as we start talking about rural there's a whole different level of scrutiny that has to happen at a rural level where they have less resources because you want to compare it back to an urban area. Where this is the first time, maybe, they got money in the rural area.

So it's a real, it's a real psychological screw-up, quite frankly, that happens a lot. And I'm not

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saying this towards, towards you.

MR. LEONARD: Well, no, because let me point out, we have three pilots: New York City, Tampa and Wyoming. Now, I know Wyoming is a mega-population center in the west but --

MR. ALBERT: No, it's not.

MR. LEONARD: -- I-80 is not particularly well built up. You know, it's a good representative of a real opportunity to show how ITS technologies can work in a rural environment.

MR. ALBERT: It is. For trucks.

MR. LEONARD: That's what I'm saying.

And I'm going to say the same thing for Tampa and New York: you have to find, you know, I want to make sure that, given that we have this tool set of ITS technologies, we apply them to problems of the cities.

MR. ALBERT: So what I'm hearing -- Oh, go ahead, Raj.

PROFESSOR RAJKUMAR: So I guess I have a couple of observations. So one is that if the increasing technologies in the rural regions because of smart phones mean we might take one set of direction, if it's because of

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drunken driving or running off the road, then maybe they could come up with variations of the automatic braking where it automatically applies the brakes. Not because that's an option first but where there's a group ready for that type of thing.

And meanwhile, if they said we're going to bring ITS into the picture, given that the rural areas are geographically very scattered and sparsely populated, infrastructure support can take too much of an investment, V2V's not going to help because there's not many to communicate with.

MR. ALBERT: Right.

PROFESSOR RAJKUMAR: Maybe the intelligence has to be self-contained in the vehicle. And maybe 4G plays a much bigger role. We are one of the few concerned about where you are, which transmits periodically so in case a person's missing you know exactly where they are.

MR. ALBERT: So George and then Scott.

MR. BELCHER: I disagree. I think we can't put the intelligence in the vehicle.

I think I actually agree with Brian, I mean, I think where you need to put the intelligence is here. And

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that's going to be cheaper and it's ubiquitous. Even in rural America, people will go for their phones before they'll go for other things.

So that's a, this is a place that you could actually make some progress.

CHAIR WILKERSON: But wasn't he talking about instead of looking forward, if there's a moose coming on the side of the road, the car, the vehicle knows rather than going forward, it can go sideways? I mean I've heard that analysis before saying in rural areas we should be thinking about the connected vehicle differently and how it stops versus kind of the deer and wildlife, other kinds of actors.

That's what I was getting at when you said the car knowing which part of the vehicle it can protect, that's --

MR. BELCHER: It can slide --

CHAIR WILKERSON: Anyway, but I don't know if that's what you were getting at, Raj.

MR. ALBERT: George?

MR. WEBB: Yes. I just want to jump in. I've been living with this for probably at least 10 years on the NACo Transportation Committee and whatever. Talking to my own actors through my National Association of County

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Engineers, talking to them. The majority of counties get the picture that I deal with out there are 50,000 population on average. So I mean these are the heartland of America kind of stuff that we are dealing with.

So whenever I talked to them they said whatever solution and stuff may come out, this pie-in-the-sky that you guys are talking about, it's got to be contained in a black box. Because I don't have anybody that can maintain, you know, we're not sophisticated enough. We barely have, you know, guys that, you know, graduated high school on our road crews, et cetera, et cetera.

So I've been trying to picture in all this where is the silver bullet to -- from an ITS perspective, this is something that will help you as far as addressing it.

The problem from the rural perspective is, you know, to get federal safety money you're supposed to show you have a safety and accident problem.

MR. ALBERT: Yes.

MR. WEBB: Well, they're scattered everywhere. There's no one location that I have here. They need money for guardrails. They need money for signs. They need money for striping, and so forth like that. So me trying to picture

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that I'm going to drop an ITS solution on you as far as safety issues, you know, it's been very difficult to figure out what that is.

So, you know, we've been competing, you know, the Federal FAST Act, you know, said come up with data and you can go get those safety monies and whatever. So we compete with state roads and so forth like that. But it is very hard from a rural perspective to get those dollars when you say, well, we don't have the data. You know, we don't, you know, we show there was one fatality over here and another fatality over here versus this urban intersection where there were three in the last three years.

And so where do you think the money is going to go? It's going to go to that urban intersection.

So, again, just from the standpoint of I like the idea I've heard, we should be putting some money into the rural areas because there's a real problem. I just don't know that I picture yet just what, from an ITS perspective, makes good sense. Maybe we just need somebody to look at it and come up with a study for it.

MR. STEUDLE: That's my point exactly.

MR. WEBB: Yes.

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MR. STEUDLE: I don't know what the solution is, but when you shine a light on it --

MR. WEBB: Right.

MR. STEUDLE: -- you get people focusing: Well, this is a problem. Because, frankly, that's what we've done in the city, we said, well, this is a problem, all you smart people all over the country, --

MR. WEBB: Right.

MR. STEUDLE: -- look at this and see how you solve this.

I think we can do the same thing, shine a light on it. Because there's a rural problem here. We don't know what the answer is. But all you smart people figure it out.

MR. WEBB: Okay.

MR. LEONARD: And, George, you know, you don't have to have the fatalities or the collisions in the same place in order to identify that there is a common pattern.

MR. WEBB: Right.

MR. LEONARD: And it's the common problem that you can solve, you know.

MR. WEBB: Yes, but if you talk about it really as systemic as far as, you know, looking at it system-wide,

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I guess, I have a lot of curves in my county. So, you know, I have people getting killed. So how am I addressing my curves and so forth like that.

MR. LEONARD: And so, for example, from a connected vehicle perspective it might be something like curve speed warning.

MR. WEBB: Right.

MR. LEONARD: So you might get the application that we develop. That could have potential applications in rural areas.

So again, I want to come back to I do think this is important. I have often cited this statistic, that more than 50 percent of fatalities occur in rural areas. But that's why I think we have to be purposeful in saying let's identify the problems that we think we can address through ITS technology.

MR. WEBB: Right.

MR. LEONARD: Because if you need to reshape your curves or you need to repair a bridge, that is another part of DOT that can address that. But that's not really something I can address through ITS.

And I want to come back again, if you're thinking

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about the rural problem, you need to think about how, I would encourage you to look at that Section 6004 grant program, because I think that is the best opportunity to get resources that could address this area. You know, that's a five-year program. And I would not delay in thinking about how you would address problems in this area.

MR. ALBERT: Anyone else?

Well, I guess I'll take these comments and try to add what I heard here and then send it back out to our subcommittee group. Sounds all right with you?

PROFESSOR RAJKUMAR: So, Steve, I heard that comment that's going back to what Scott said, that the smart phone technology, that basically we have this, so if we can get technology in there could easily be propagated widely so it gets it out to those locations.

MR. ALBERT: Right.

PROFESSOR RAJKUMAR: On the other side of the coin, I guess going back to the other Scott's comments earlier.

MR. ALBERT: I think there is another aspect of this. And, George, I, at the national summit that we had, it came out loud and clear is we don't have any money to

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collect data or people to analyze it, or people who know what to do with the data once they have it. And, and this was more at the county and local level, not at the state DOT level. We're going to have a lot of FTEs associated with this.

So I'll make sure that those get in it. But one of the things I was thinking as part of the grant would be a refinement of the data that you do -- the knowledge or information you do have about the conditions of your roadways and, generally, where accidents may happen. And then as part of the grant, maybe make, you know, the first task is refining the performance of your transportation system and where are the problems. So you can build it into the new money that may help you out more long term.

MR. BELCHER: Do you know the answer to this question? And I don't mean to talk about a stereotype but I am going to say that. Just, I mean do you have statistics about the turnover of vehicles in rural areas versus the turnover of vehicles, the vehicle fleet in urban areas?

So my stereotype is that it kind of --

MR. ALBERT: It's twice as, it's almost twice as long.

MR. BELCHER: It is?

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MR. ALBERT: That's, that's the numbers at least that I know of.

MR. BELCHER: Because, because you keep cars longer?

MR. ALBERT: They keep cars longer, twice that as in urban, urban areas.

MR. BELCHER: So does that mean is it -- so are you saying it's 30 years versus 15 years?

MR. ALBERT: No. I had always heard that for 15. Urban model was less than 7 years. And the --

PROFESSOR RAJKUMAR: It's about 10 years for the urban environment.

MR. CAPP: Yes, the average was like 11 for the U.S. So the average car is probably 15 in the rural areas.

MR. WEBB: Right.

MR. CAPP: The complete turnover of the fleet --

MR. ALBERT: It's a crap shoot.

MR. CAPP: -- it's at least a generation.

MR. STEUDLE: Well, the other thing is, and maybe John knows this, but it's probably the type of vehicle.

MR. BELCHER: Right.

MR. STEUDLE: I mean we're talking about here. I

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mean so I've got one that's 13 years old. I don't have any intentions of getting rid of it in the next five years because it's built really well and it's going to keep right on running.

MR. BELCHER: Yes.

CHAIR WILKERSON: Same here. For a 22 year old Volvo never dies.

MR. STEUDLE: Mine's a good GM.

MR. CAPP: That's the reality, you know, when we think about it vehicle technology today. It keeps on running because it's closed. You know, the technology in there it's going to take longer to get them to in the fleet because people do hang onto cars longer.

MR. SCHROMSKY: I think the number we have is we estimated in our market there's 150 million unconnected vehicles today in the United States, is the number we came up with.

CHAIR WILKERSON: I would just say to my fellow telecom folks is that when we went through this issue with the '96 Telecom Act, one of the things we had was the rural/urban haves and have nots dialog. And we addressed some of this. There might be some lessons learned from that.

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Fortunately, we had leadership at that, time like Senator Dorgan and others, who made sure that there was broadband in Fargo and Grand Forks and other parts of the country. But there were some lessons learned from that.

But also in the E-911 debate about those rural areas you could not upgrade their public safety equipment. They didn't have the funds. They had to use those funds for emergency services. And we ended up revamping all that to make sure that those devices could be used in those rural areas.

So I think these converging factors have had some similar issues. And there might be some way to look at some of those lessons learned as we speak to our new leadership in a new administration. You might want to think about those. So just a thought.

MR. BELCHER: Well, it's another way to support the effort.

CHAIR WILKERSON: Yes.

MR. BELCHER: Because there is -- they do have a mandate and can collect funds to do that, I mean, so.

CHAIR WILKERSON: It's just a thought. Or it's an analogy in another sector that we might be able to find

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some analogies with.

MR. ALBERT: Well, thanks.

CHAIR WILKERSON: Okay.

MR. ALBERT: Thanks, all, for your input.

CHAIR WILKERSON: Thank you. That was great.

MR. ALBERT: Even though you couldn't see what the hell I wrote.

(Laughter.)

CHAIR WILKERSON: You circulated it. And you said it again last time.

MR. ALBERT: One of the things that was really good, and I urge you to do this. And I don't know how much I spoke about it in this summit, was this summit was no talking heads. It was all people just talking and no PowerPoints.

And the first day was everyone being permitted to work from their individual silo in the area that they're comfortable with. And then turning that sideways and bring people out of their comfort level and see what they say about different things.

And that worked wonderful. We got, I mean as you can see, probably a dozen emails and letters saying this was the best conference they'd ever been to. So instead of

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trying to do just a whole bunch of talking heads, we moved from session to session to make sure that people got heard. And all they want to do is talk. Give them the venue to do that and make it a little uncomfortable for them so you see what they really believe.

MR. SCHROMSKY: One thing, Steve, I noticed on this committee which looks -- the Steering Committee -- anybody from National Sheriff's Association or IACP?

MR. ALBERT: No. But we did have a number of police officers there.

MR. SCHROMSKY: Okay. Because I think National Sheriff's --

MR. ALBERT: Yes. As well as emergency first, you know, first responders.

MR. SCHROMSKY: Yes. Because I would say working with both those groups, IACP and NSA, a different NSA, National Sheriff's is probably more applicable because they would be in a lot of rural areas, sheriffs and local law enforcement. Maybe something of interest.

MR. LEONARD: Steve, I'd also add while we kind of focused a little bit on the safety piece and the fatality piece, the same issues that we're trying to address across

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the board on the ITS program, safety, the mobility piece, the economic efficiency and productivity section.

MR. ALBERT: And that's just what I was going to say. Everything in rural America is really about the first. It's the economic engine.

MR. LEONARD: And the other lesson I want to take out of what we've done on the Smart Cities, you know, when I talk about what we were doing there it really is the nexus of technology and people's needs. And people in rural areas have the same needs, or different needs in some cases. But it's still how do you connect technology, data and what people need in that community?

And so I think a lot of what we were doing with Smart Cities, that framework is applicable in thinking about the problem of rural areas. The problems may be different but the nexus of people and technology needs is the same.

CHAIR WILKERSON: Okay. Well we're a few minutes ahead. So I would recommend that we take a 15-minute break now instead of waiting to 1:45. And then that way we might be able to finish up a few minutes earlier. But if we could be back here close to 1:45. So it's 1:34. 1:45, 1:50, thanks.

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(Whereupon, the above-entitled matter went off the record at 1:34 p.m., and resumed at 1:51 p.m.)

CHAIR WILKERSON: So let's get started with Scott who is going to talk about Technology and Active Transportation Subcommittee.

MR. MCCORMICK: So, we had a number of items that were tabled at the last meeting. It hasn't actually met although I've had conversations with a few people.

On the first one, to promote frequency allocation. And the discussion that we had last time, you know, both Scott Belcher and I have testified before on the spectrum, protecting the spectrum of the DSRC with, I'll call it limited success at best.

I don't know, given our previous recommendations on that, what more we can bring to the table. I thought we'd pretty much beat it to death. It's moving forward. The FCC is doing testing to determine whether or not having unlicensed devices hammering at, capturing, finding, that there is, that there is a licensed device already on it and releasing it, it actually does act as a denial of service attack or if it's something that's manageable.

Well, we're somewhat hobbled by the fact that we

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really don't know, you know, the tests that we ran collected 600 terabytes of data from the Ann Arbor project. And only 10 percent of those vehicles were actually, you know, distributing real information. The other ones were just putting a load on the system.

So until we actually have that CTS out there to find out what interference might be occurring that we're not aware of, or how much bandwidth it actually does consume, and whether or not there are performance degradation issues because of other radiation and everything else, I don't know that this committee can do anything more on doing something for the frequency allocation. But I'd certainly defer to Brian if he thinks of something that we ought to be doing or not.

MR. BELCHER: Do you know anything about the test, the status of the testing? You know, the testing of a sharing device?

MR. LEONARD: We're funding testing activities on -- well, FCC, you know, is doing some testing. They've solicited, they put out a call for devices. Those are in the Columbia lab.

MR. BELCHER: They are?

MR. LEONARD: Right.

MR. BELCHER: Okay.

MR. LEONARD: I can't remember the exact number. They got devices both for existing protocols and also for internalization protocols. And I don't have the details on the specific numbers. But I've heard of around eight or nine devices.

They're also funding some testing up at Aberdeen. And we're working very closely with FCC and FAA to make sure that, you know, because we really kind of jointly developed test plans but we're going through different aspects of them right now.

So there's a lot of stuff in testing going on right now.

MR. LEONARD: There is. And whoever cracks the nut, particularly as it relates to some of the attributes associated with your 5 million Americans, the same issues you're going to have in 5G, if you're talking about latency and speed and reliability.

And sharing is going to be essential there, too.

MR. SCHROMSKY: Yes. I mean, look, I think one of the things, especially on 5G, what's unheard of if you look

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out ten years ago, you're looking at the upper spectrum, which you really, you know, was frowned upon in a lot of cases when you're rolling out technology. Right?

So what you're looking at, and kind of going back to George's point and why he's getting bombarded to put those small cells. I mean the idea is it doesn't traverse as far; right? When you get into that upper echelon.

So you're just talking about low latency, but at the same time I have to provide more access points than ever before. So that's probably a fundamental shift probably in the last ten years which, you know, the prize was the lower you go, or 700 megahertz, or 600 megahertz is out right now, but now there's this renaissance of the highly lucrative six, whatever it may be on the high end.

And then we actually were granted FCC testing to do LTE on unlicensed spectrum as well. So, which I thought was interesting, which can play into possibly DSRC as well, but possibly supplements. Right? Because the other big thing you're hearing is carrier aggregation is the big thing where you're taking multiple frequencies and bonding together. So all of, or most of your devices have, who knows how many frequencies here in the U.S. And then you figure

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the radio supports so many different bands overseas as well.

So, you know, as Susan mentioned before, the technology's changing and then, nobody wants to touch that. But now all of a sudden what's the hot is the upper bands.

MR. BELCHER: But sharing is part of the future, has to be, right?

MR. SCHROMSKY: Oh yes.

MR. BELCHER: It has to be. And so that is really important.

MR. LEONARD: You know, and this is similar to remarks I made out at your event.

MR. SCHROMSKY: Yes.

MR. LEONARD: I think we've got to really see what 5G develops into. But the attributes that we designed into the DSRC ecosystem, there's certain characteristics, the latency and the ability for a security system, and just creating that environment, to have a piece of spectrum on which you can have these collision avoidance communications.

We need to make sure that however spectrum evolves in the future, that the collision avoidance aspect of the signal, you know, that that criteria is still met, whether it's in a shared environment or in a sole-license

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environment, from a transportation perspective if it doesn't avoid the collisions, then we've failed to meet a public need.

MR. McCORMICK: So back to the question: should we promote frequency allocation? I think we've done that. And I know it's my personal opinion, unless anybody wants to pick at it, that we've done that over the last two PAC meetings.

MR. KISSINGER: Is the issue, I mean is the issue of less concern today than it was few years ago?

MR. McCORMICK: No.

MR. KISSINGER: I know we, yes, we've done it. But I mean the point, I mean I don't know, the spirit of that I think is should we be continuing to promote, you know, our needs so that --

MR. McCORMICK: Those are questions for Ken. I mean having made a recommendation is it appropriate to reinforce the recommendation going forward in this committee?

MR. LEONARD: This committee just reinforced its recommendation I thought with a letter to the Secretary.

MR. BELCHER: Right. But we'll have a new, we'll have a new Secretary by the time this letter gets out.

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MR. McCORMICK: Right. That's exactly where I was going with this.

MR. BELCHER: I think to a point I just made earlier, I think before, that spectrum is now prized, which when it was allocated it, was as prized, I would say for the marketplace in terms of the monies. So that's a fundamental difference from let's say a couple years ago. Just because now you're rolling out technology in the upper bands which you're in 5.9, it's taking a 10 megahertz slot that you have, that's more prized than it was a couple years ago.

MR. SCHROMSKY: And I believe the FCC will be done with its second level of testing and will be recommending in March, if not already. So, all right, we can do that. I'll do some wordsmithing on the last recommendation so that going into the new administration we have that reinforcement.

And that begs the point of whether or not there's other previous recommendations, that that's valuable to as well, to do as well.

MR. CAPP: Or separate maybe from the lobbying aspect we can start involving -- back to your statement -- that regardless of which combination of the different frequencies or whatever are used, is there, is there work,

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does it make sense to do work or are we doing enough work in terms of clarity? And maybe somebody can give an answer. Or rather I'm trying to find are there other combinations of these technologies, the spectrum and sharing, that could still achieve all of our requirements?

Right? We'll check all the boxes. Because if we check all the boxes, right, don't really care which method we use. If we could turn to that, hey, we don't know if we can meet the requirements of the FCC, et cetera. Do you think there's other work that would make sense for the program to do? Or does it make more sense to wait until there's a little more clarity there? In the near term it's probably going to solve itself.

MR. LEONARD: Well, you know, we're continuing to do research because as long as the spectrum sharing is on the table, and it is, FCC has a pending rulemaking, we will continue to do research.

You know, as I said before, this is not work we had planned on doing because sharing was not on the table, you know, a couple years ago. But it's an issue now. We'll continue to do the research.

We're going to continue to work with

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international organizations, for example, with regard to understanding, you know, what's evolving on 5G. How might the transportation needs be met in the future on 5G?

So I just think that's work we've got to continue to do.

MR. CAPP: Yes. So we'd expect that that's true. I mean it's probably covered.

MR. BELCHER: But I was just playing through in my head, you know, so we've had a Republican Senate for the last two years, and a Republican House for the last six. And we've been up, or at least I was up lobbying, many of us have been up lobbying on behalf of 5.9, protecting it. And the feedback we would get is it's really valuable now. And there's other, other industries that can take advantage of it now and use it if we really want -- you know, we're not sure we can continue to protect this.

And I was just trying to play out in my head what does that mean for the new administration? I mean does that -- is a new administration going to make this available to the highest and best use immediately? Or not the highest and best use, but maybe the most, the most financially beneficial use immediately because it can be used? Or are we going to

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try to protect it for its highest and best use.

And I couldn't -- I'm not sure I can process that in my head. I can't guess. I don't know if anybody else has any thoughts on that because that might dictate what or how we say what we say. And we probably don't know until we get to know more about the administration.

MR. CAPP: And I think we would be advised to separate this concept, and I think we'll find the same thing. It would be pretty smart to keep studying these different sharing concepts because there's a fair chance we're going to have to live with one of them at some point. But if we're already doing the work, then it's an approach.

MR. McCORMICK: Good point.

So maybe what we do is we extend that and refresh the recommendation to include the spectrum-sharing consideration.

In terms of the next one, the role of ITS in establishing the evolutionary roadmap for connectivity, I did a little thinking on that one. And my earlier comments about, you know, people tend to project linearly along the technology that they're familiar with, along communications, along processing, along sharing, whatever that is. When in

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reality what actually occurs is something editorial.

And my suggestion is that rather than putting together a roadmap, because we don't know when 5G is going to hit. We don't know when everybody's going to say it's ready to be primed out. We don't know when the generation 10 processor is out. We don't know when, when the next level of moving from 8S to some automated level functions is actually going to occur pervasively in the automotive environment.

So rather than having a future guess, is if we know what the state of reality of the technology is today for each one of those areas, that allows us to look at, well okay, what's the next -- through some industry input -- what's the next thing that they're working on?

That's a lot easier to figure out where we're going than, than trying to say that, okay, we'll have 5G by 2021; we'll have 6G by 2025; we'll have a processor that does this by 2020. And we don't really know what to make of the editorial aspects of all these changes.

So it's still, it's still a roadmap but it's, you know, the roadmap up to where we are and where we might be real soon.

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And then the question is, is that the recommendation to the JPO, the work of the committee isn't to create that roadmap, it's to create that recommendation of what they should be looking at doing, what they should be doing with it.

And I think for them, that's a more manageable task because now we've already got people that are being familiarized with whatever the technologies are that are available right now, and being made familiar with what they believe is coming the very next thing, not five or ten years out. That proposing that they craft that type of a roadmap is doable, it's manageable, and it would be of high utility to their work.

PROFESSOR RAJKUMAR: Just, I guess a couple of thoughts. To me it's not clear that the incoming administration is coming in with a mindset. So it is probably useful for us to basically set the table up.

MR. McCORMICK: Yes.

PROFESSOR RAJKUMAR: And argue for a wide spectrum to go forward with.

MR. McCORMICK: Right. So just the framework for that. Yes, I agree. Because, again, we don't want it

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to be just the dimensions that any one of us are familiar with, we want it to be everyone's understanding of what already affects our future.

Now, the infrastructure side of it, I don't know how roads are going to change. I don't know how the sidewalk furnishing, I mean the furnishings are going to change. Because, obviously, things that are going on in various parts of the country that have varying degrees of value and benefit, that ought to be in that consideration because if we're just talking about do we have vehicle-to-vehicle, vehicle-to-infrastructure could occur by cellular, for all that matters. So those are things we don't want to define it by, you know, whatever the DSRC is, but the communication protocol of choice, that you want vehicle security.

All the other things that need to happen don't necessarily require all those.

MR. SCHROMSKY: You want it on any frequency or on any technology.

MR. McCORMICK: Right.

MR. SCHROMSKY: I think one of the things, a key point as I sit here, on the 5G topic, from a JPO standpoint. Let's assume 5G is deployed everywhere in the United States,

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what else would you need research on to make this happen? I mean if we take out some of the unknowns, right, and say okay, we have low latency, we have 5G everywhere. Now what? What else? You know, what's your hurdles for adoption or, you know, security, cyber still comes into play.

But if you just, you know, in a perfect world if that's solved, what else do you need research on that -- you know, if you know what I'm getting at, let's just take that off the table. What else do you need? Or what?

MR. LEONARD: Well, I think we just want to make sure that any communications medium that safety messages were migrating to work as effectively. And we've been investing in testing of DSRC for some time. We know how it works. We know how well it works. And any migration to a new technology we want to make sure that we have that level of performance or better.

So I think that real world testing, that priority testing, that's something I think that would have to happen. And, you know, that's going to be a perpetual redesign of technology as it comes in play.

But, like you said, in a perfect world, assuming that 5G has all the attributes that are necessary for vehicle

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communication, privacy, and all the things that are built into the DSRC ecosystem, then in that respect then I think the key issue for society or for industry is the backward compatibility for all those devices that the states deploy in 5.9. How do they, how do they make sure that they migrate to that environment?

Because we've got this, you know, wide range of, you hold onto this device for three years, you keep your car for 11, and keep your roadside units for 40. So how do you make sure you've got that kind of migration?

But it doesn't end with 5G.

MR. SCHROMSKY: Agreed.

MR. LEONARD: So I think that's some testing that we would have to do.

MR. McCORMICK: Yes. That begs another really important point that you're making is that having a well-defined understanding of what those boundary requirements are for any replacement technology.

I mean periodically we have these questions: you know, why can't I use this for that? Why can't I do this? Why can't we replace 5G with DSRC?

And, well, you still have the lack of security.

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You still have the ability for it to be interfered with. You have all kinds of other things that are out there. So having a migration plan to a different communication profile, or any different technology, needs to carry with it what are my legacy requirements? What are my boundary requirements that whatever we replace it with has to satisfy?

PROFESSOR RAJKUMAR: And the final question for you, my understanding used to be that 5G is going to take some time but maybe there will be a 4.5G deployment that will be created.

MR. SCHROMSKY: Probably not, no. You're trying to do that with LTE advanced right now. It's going to be a stopgap. So really what you're doing there is carrier aggregation and high-end capacity. So just because of the proliferation of smart phones, tablets and IOT.

But the next jump we'll go to 4G, LTE, LTE advanced, and then you'll go to 5G is the plan.

Now, we're looking at commercial launch 20, late 2017. But keep in mind, publicly stated ours is --

PARTICIPANT: 2021.

MR. SCHROMSKY: No, no, no. In 2017. They were announcing it yesterday.

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One of the main uses is fixed wire line replacement. Why? Very expensive to build trucks, very expensive to run cable.

So how do you consume the Netflix or anything else, you would do it all over cellular or whatever it may be, and replace it, you know, different spectrum, you know, you could do certain things out there. Because you're going to start reframing some of this current spectrum you do today.

So, you know, I guess my mind's working and saying, you know, in terms of research, right, assuming all things are level, right, you have a network. Because I'm in R&D, you can probably do some of this stuff on 4G. But just if you have DSRC, you'll have two vehicles talking, you know, GM and Ford for the sake of argument, right, I've got DSRC. You know, what needs to be done for John to say, Okay, now I'm getting comm from back and forth, what does that look like in the vehicle to the end user? What am I, you know, what does that look like? Right?

I think we're still on the fundamental transition piece. But just go a little bit further, that's solved. Right?

I don't even need LTE, right, if I'm just doing

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point to point.

MR. McCORMICK: I'm not concerned about the user. The end user for DSRC is the vehicle.

MR. SCHROMSKY: Well, the vehicle to some extent. But as I went to the test tracks and different things in Ann Arbor, right, I'm getting some feedback that I have to take some action.

MR. McCORMICK: Yes. But a lot has been done to help people understand what it is. It's not necessarily what you need --

MR. SCHROMSKY: Right. But I --

MR. McCORMICK: -- for vehicle to vehicle safety.

MR. SCHROMSKY: But what do you --

MR. McCORMICK: I understand.

MR. SCHROMSKY: You know what I'm saying? I mean, am I totally hands free and the car's going to brake and open up the door so I can roll out? Or is there a corrective action that the end user, the operator, I start feeding that data in, right?

So solved for the communications piece. I've got comms between two. He's, you know, John's hard braking and I can't see it because of Peter and Raj here; right? What

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am I doing? What protocol coming back? What does that look to the end user? Is there standards, or ought research be done to say, -- because when I was on the committee the whole idea was, you know, there's a protocol stacked around safety. Okay, now that I have a connection, what am I supposed to do?

Is there a common platform that says you have to get right here to use four things? I don't know. I mean I don't know if JPO, okay, now that you have intelligence in there, I'm feeding more data, what am I actually doing with that data?

Now I'm very curious to see, we kind of get around this comms piece. We keep dancing around. We say, okay, if that's all level -- I mean correct me if I'm wrong -- but what do I do now?

Right? I mean what's JPO's role? What research needs to be done? How does, you know -- Is there a mandate, right? That you say, hey, we need to have these many things, right?

I mean you kind of see this today, we talk about electric vehicles today, can do sound. There's a mandate to have a rearview camera. That's coming out. Or other things that once you introduce this technology that you need

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research on, that says, okay, now I have it, what do I do?

PROFESSOR RAJKUMAR: See, if I were to take a stab at it, Bryan, so to me I guess for a substitute for DSRC needs to have some sort of an implicit service-level agreement, if you will. Some sort of guarantee of some kind. Safety messages only capturing other safety messages but not other things.

MR. SCHROMSKY: Correct.

PROFESSOR RAJKUMAR: To its advantages and so on.

MR. SCHROMSKY: Sure.

But there is precedent, I guess, from electronic toll systems; right? That your, you know, there's a frequency, right, I have my transponder in my vehicle and I'm passing financial information, which is sensitive information out there. And it's been proven and probably been out there, what, two decades at least now. I don't need anything. You know, do you know what frequency is being used? Is it all the same frequency for all these transponders? I have no idea. But I'm sure somebody does.

But at the end of the day, now that I have that up there how do I collect the money, how do I, now that I have that transmission, what's the economic benefit? Does that

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reduce traffic?

One of the things I struggle with is, you know, let's assume everything is constant.

PROFESSOR RAJKUMAR: So with the DSRC because the fee is dedicated, you said that this can be free if --

MR. SCHROMSKY: Yes. Yes.

PROFESSOR RAJKUMAR: For, again, this transmission you said you have to go through a carrier, latency share, --

MR. SCHROMSKY: Well, I think the question is if there was a mandate, right, that says, okay, you're going to have to have a DSRC modem in there that would use 5.9, GM or Ford and all the manufactures have to build it and put it in the black box in the vehicle; right? It could be able to communicate off that frequency that I have dedicated already. I can do that today; right? If you're going to build smarts behind there, it's a modem at that point; right? The computer's going to be an onboard computer.

MR. McCORMICK: Right.

MR. SCHROMSKY: I think the question is, if we separate that, the question is it's an invalid agent, if you will, invalid vehicle, how do I reach that vehicle and disable

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that? Right now that's where cellular come into play, the, you know, how long's their certificate. That's a valid, you know, conversation.

But some of this you could do today. I think what we're all waiting for is it going to be mandated, regulated that's going to do it or?

MR. McCORMICK: You don't actually just say -- what you do is you disenfranchise that set of codes as a legitimate sender.

MR. SCHROMSKY: Yes.

MR. McCORMICK: But, you know, I don't -- But the point is, to your point, is that if we go to 5G point to point where now you have a chip in your car, you're a miniature cell tower, you're still not paying spectrum. Right? And it has the advantages if you get close enough to a tower it does communicate to it.

And that's the question that I don't think you guys have figured out yet is how somebody who can now be identified and charged for that, as opposed to --

MR. SCHROMSKY: Oh yes. I mean, yes, it's on a free serve.

But what I'm saying is there's things that you

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could do today that you don't necessarily need.

MR. McCORMICK: Well, you touch on something I think that's not, you know, --

MR. SCHROMSKY: Cellular technology, I mean as much as I want, there's things you could do today that doesn't require that. I mean you have examples of doing that today. I think that's where I think we kind of dance around this and say, okay, is there going to be regulation that's going to force me to do this.

MR. CAPP: Well, I think the application work that's been done over the years was kind of identifying, you know, which, which application you need --

MR. SCHROMSKY: Yes.

MR. CAPP: -- to meet all those requirements. Because there are things can be done in other ways..

MR. SCHROMSKY: Yes. Right.

MR. CAPP: So I don't know that that's a roadblock per se.

MR. McCORMICK: It is. Well, 14 years ago we developed 187 use cases. And then 12 years ago we identified the 81 that belonged in this case. So I think that work's been done.

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But you touched on something that I think hasn't been addressed that probably needs to be. All of this stuff we talk about with DSRC and 5G or anything else, all has to do with the connectivity.

Having connectivity is just the first step. The next step is to get the cooperation that has to occur. In other words, when your car is communicating with my car --

MR. SCHROMSKY: Mutual trust.

MR. McCORMICK: -- and my car is communicating with the infrastructure. So in order to go to that next step where you have smart transportation management at a macro level by the transportation agencies, if you have this capability in the vehicle, how do you make that cooperative; not just communicative, but how do you make it cooperative?

How do I know that your car wants to get off the expressway and then either as a driver or autonomously the car knows to back off and let you in? Or any other driving situation. How do I know that if you're out of control or turning left that I need to know that?

And that probably needs to be part somehow of the evolutionary make-up. And I just classify that as kind of a general aspect. It's not something specific like one of

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those use cases that says here's what I can communicate, here's what I can do if I receive this information. It's now, what goes on at the next level so that the traffic can become self-managing, eventually self-managing?

MR. SCHROMSKY: Well, I mean, don't disagree. I mean I made the example before --

MR. McCORMICK: We might want to think about putting it out in the --

MR. SCHROMSKY: -- whereas it was common, right? You had GPS or Garmin or TomTom; right? You know, a lot of what GM is developing, right, crash avoidance, you know, self-parking vehicles, they're all using technology.

I think when you introduce connectivity, DSRC, whatever it's going to be, I would agree with you, you then exponentially increase all the different functionalities that you can get out. But you can only do so much today.

And you're going to hit that ceiling and say, okay, what's that next evolution that's going to do it?

So I mean a lot of what you're talking about is being done today in an independent environment because GM wants to sell the safest car. Right? And here's all the safety features I have compared to the competition. It's in

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your best interest to do so.

Now, if you introduce a new platform in connectivity, you could introduce and you have smarts and you can take other feeds. Right? Just what we talked about before, right, I have a Garmin, now I have Waze. It's the same thing, now I'm taking traffic feeds, I'm taking weather feeds, I'm taking DOT feeds, and I'm making it smarter; right?

I agree with you. I mean I think, I don't think you want to -- 5G solves a lot but I don't think -- there's some things you can do now.

MR. McCORMICK: Right. I agree.

Peter, I meant to ask you, you're a TBD on this committee, aren't you? You're a TBD on participating on this committee if you want to.

MR. KISSINGER: I'm happy to help.

MR. McCORMICK: Okay.

The next one we have was funding and deployment issues. And our conversation the last time that, actually Ken gave us a lot of education on how to get the funding and where we go.

I would like to ask a sort of a foundational question first as what's going to happen, what steps do we

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go through with the new administration with regard to transportation funding and allocation to your budgets? I mean do we know what will happen? Is nothing going to happen? Is everything going to happen?

MR. LEONARD: How many times have you heard me say I am never going to guess what Congress is going to do? But I will, I will tell you what I know.

MR. McCORMICK: Okay.

MR. LEONARD: From publicly available materials. We're under a continuing resolution that ends shortly. This week.

MR. McCORMICK: Right.

MR. LEONARD: I'm anticipating that Congress will vote for a continuing resolution. I have heard two possible dates: March 31st and April, end of April.

MR. McCORMICK: Okay.

MR. LEONARD: 28th April. Which would then give us 50 percent of our funding. And presumably there would be some action in March or April with the new Congress to continue our funding.

We are -- if we get a continuing resolution that has an impact on some of the budget increases that were in

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the FAST Act, because the continuing resolution is based on the prior year funding. So the increases that DOT was slated to get would not come under that continuing resolution.

That has some small impact on us.

MR. McCORMICK: Okay.

MR. LEONARD: And some larger impact on DOT generally. I think to the tune of 5, 6, 7 percent. I can't, can't remember.

But right now we're spending money, you know, under the continuing resolution. We have prioritized our funds in terms of funds we want to get out before December 9th, funds we plan on getting out between December 9th and March 31st, and lower priority work that, you know, that can wait to get funded until after the next continuing resolution.

Does that help explain?

MR. McCORMICK: Yes. Yes. And it actually leads to my next question.

I mean given that the administration and the new Secretary can decide to disband all of us and reconstitute with people that they like, the next question was that they all, both the parties when they were running for office had

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a strong infrastructure support position.

And having said that, when Kirk and I had a little dialog on this between us, is that is there something we should be thinking about in terms of the V2I aspect, that if the administration moves forward with a heavier emphasis on infrastructure, beyond just repairing and maintaining, is there something that we should be weighing in on?

Because obviously, you know, we shifted all this to V2V over the last few years. V2I, whether it's rural or urban or anywhere else, has a huge value. And it's one of those things that says, well, okay, should we start thinking more about that? Or is the reality of whether or not they move towards more infrastructure to spending a longer term process that we wouldn't have to worry about it for the near term?

MR. KISSINGER: If we put V to X on the wall we aren't going to be able to get funding.

MR. LEONARD: Sheryl, I wasn't sure if you were going to say something.

So we're -- I don't, again I don't know --

MR. McCORMICK: We don't know. Correct.

MR. LEONARD: -- the answer to what will, what the

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priorities are and the timing of the priorities of the new administration.

What I can tell you that we're doing in the Joint Program Office, and you've characterized it fairly well, we have focused very much on V2V. And some people think that was the right focus. Some people think we should have focused on other pieces.

But that's where we put our focus. And we have been this year, and maybe a little bit last year, turning to more of a V2I focus. Discussions we're having within the Joint Program Office are, what does that mean? Let's reassess where we are on our V2I program because some activities that people had planned three or four years ago may no longer be appropriate topics for research.

I talked a little bit earlier about our vehicle/pedestrian program, not wanting to just pursue a legacy path that we had been on, but to reflect the fact that we now have five, five or six V2P pilots going on in the real world, and to make sure that we're validating the results of that real world research rather than doing just a pure laboratory piece that's unconnected to that. Which is what had been planned, you know, originally for V2P activity.

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So this gets to being a little bit more agile and nimble about where are we. So we're really in the process of trying to broadly assess where do we want to go on V2I, and what does that mean?

I want to ensure, you know, what further work we have to do on RSU standards, where we are on human factors, what investments do we need to make in applications versus applications that should be developed outside of the Joint Program Office or outside of the Federal Government?

So I think that's an opportunity to have a discussion around. Certainly it's something we're having discussions on. So if the committee has insights into future directions for V2I, that would be welcome.

And that's just in the connected vehicle context.

MR. McCORMICK: Well, but on that, I think what would be very valuable, in order to do -- and forget for a minute the funding and deployment issue -- but to go back to that evolutionary roadmap because I don't know -- I know that I don't have a robust understanding of all the programs, the V2P programs, the other, the other non-vehicle programs if you will, that probably ought to be figured into that roadmap.

My purpose for doing that would be to say, well,

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okay, all the things that are being done are now tools in the toolbox that might lead you to do something else. What you do for V2P you might be able to do for motorcycles, or baby carriages, or whatever, right? Or for other things completely.

So I think maybe when we create that initial framework that you were talking about is that one of the things we want to do is come back and say, okay, tell us where the other programs that you have and we really don't have a lot of visibility or paid a lot of attention to, but maybe we should start now to understand that.

MR. STEUDLE: Look, if I could add, I think, Ken, your point was, was spot on. Flexible, nimble, moving and adjusting from my vantage point gives us the most indications as to where you're flexing to and where you -- or what are you designing? Until you just said that about V2P, I've never heard that before. Didn't know you were -- didn't know that was not interesting enough.

That's the kind of communication that people ought to, in this community, ought to know. Especially as they're planning should be on the table where they're trying to go. And all of a sudden you've taken an exit ramp and gone

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some other direction, they need to know, okay, we're not going to do this. We're not going to be that interested in this anymore. We're kind of interested in this.

So it comes back to that question earlier about the strategic plan and annual modal plans. That's probably, and I think annual, even annual gets a little bit long for the, you know, the changes that we see in six months, and the technologies and how fast things are advancing.

We're having that same internal discussion at Michigan about updating every six months because it's moving so fast. The things that we thought in April, here's where we're going, and we're doing some different stuff. And I suspect that you are as well. But communicating that broadly I think is the bigger issue.

MR. LEONARD: Yes, I'm not sure when we -- it's been a while since we've met and we've done just a broad portfolio review --

CHAIR WILKERSON: Right.

MR. LEONARD: -- on the JPO. We brought in some other topics for discussion.

If I convey the suggestion that we're not interested in V2P, then I misspoke. It was that we were --

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because we put so much resources into it, we want to make sure that we don't stay wedded to some ideas we had three or four years ago, and we update them to apply to what we're currently doing.

And I think that's true across the board.

MR. STEUDLE: I took it that way.

MR. LEONARD: Okay. And I would add that all of this needs to be evaluated in a "beyond DSRC and connected vehicle" context. Smart Cities is going to be an important part of our consideration because of, you know, some alternative communications, low cost sensors and --

MR. McCORMICK: Well, it's bigger than that. I mean Kirk and I talked about this two years ago. If you look at it, the smart vehicle, the connected car, communicating on electric and hybrids to the grid eventually, and to smart infrastructure, is going to communicate -- we have the same call you in earlier, just anecdotally, at least you're Fitbit talking to your phone or your Nest talking to your computer. It doesn't really exist pervasively on any structured format. It's a label that people put on their goods and services they want to sell.

When you look at the amount of information, the

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car can be and will be transmitting to the grid and to the smart infrastructure. And given the fact that it will be your satellite site or WiFi and the DSRC, it will probably be the first major instantiation of how the communication protocols for the internet of things has to work.

And it will also have to have a structure to the rulings behind it beyond the policy level for privacy, security and anonymity. And when we look at that, now these things are -- well, the smart grid reasonably, we know this from looking at the smart city things, most smart cities don't know what a smart city is. Right?

And so the issue is that, well, they need to be connecting to the smart grids. That you have these other smart nodes and data analytics or quantum processing and services, and all these other things that if you get into the idea of socialization of knowledge that says you, as a smart transportation, share what information you can of relevance to me at the smart grid, and I'll share whatever I have back. It's not an equal footprint goal.

But eventually, now you're putting it in an environment where every node can be more efficient and effective by having that connectivity. And everybody

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outside those major nodes, whether you're a soccer mom or a university or a business, or another public entity, can now interrogate, provide information and get information back.

That's all going to come about because of this communication. It's not going to happen because Cisco, or Verizon or somebody else calls what they're doing internet of things. It's going to happen because this is the first real instantiation of the massive transfer of data.

DIRECTOR LEONARD: I think you've kind of summarized how we got from connected vehicles to the Smart City challenge.

MR. McCORMICK: Okay. So having said that, I don't know that there's anything more on the point we can talk to until we get the NPRM out. I mean until you've got a rulemaking that says you have to put it out there it's, you know, companies like GM saying we're going to put it in the CTS next year.

So I'm not clear what this committee can add with regard to either the funding or deployment issues. We can tell you we need \$100 million more but that's not going to be any more useful than saying we need \$10 more.

We can say we ought to be deploying at a faster

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rate, but without the funding that Kirk may have from the state of Michigan or you may have from the county or somebody may have from a city, I'm not sure what this committee's value is in funding and deployment.

MR. KISSINGER: Well, inasmuch as, you know, as I think the spirit of this or the next letter is partly to raise these issues with the new Secretary.

MR. McCORMICK: Okay, fair enough.

MR. KISSINGER: And inasmuch as it seems like there is no consensus as to what infrastructure means, and I would argue that probably the kind of things that we've been talking about are not what most people in town view as infrastructure, that this is an opportunity to make sure that --

CHAIR WILKERSON: Right.

MR. McCORMICK: Okay.

MR. KISSINGER: -- if we feel that way and to make our case, we shouldn't forget about the infrastructure associated with these technologies.

MR. McCORMICK: I think that's an important deployment recommendation. I still don't see how we make a funding recommendation.

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Kirk, you were going to -- Do you want to add?

MR. STEUDLE: So, well, in a sense that --

MR. McCORMICK: It needs funding?

MR. STEUDLE: Don't forget it --

MR. McCORMICK: Yes, okay.

MR. STEUDLE: -- is one thing.

And I'm not sure, but I guess Bryan knows, but you know, you know the Trump team seems to be talking mostly about funding versus tax credits. And what I hear around the traditional, sort of more traditional infrastructure side, is not a lot of companies are going to see a return on investment.

Mainly I, I mean I can see the IT side.

MR. McCORMICK: He says not a lot of return. But I can see private companies making money down the way.

MR. STEUDLE: So one of the things that I think does fit into this -- and this was seen in the video -- is the fact that they have a thousand traffic signals instrumented with something. I have no idea what. I don't know how they're communicating.

MR. McCORMICK: Actually they don't. I didn't want to interrupt yet. But how the Audi system works is that

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it actually is a cellular connection back to the traffic management system. So it can't handle, right, it can't handle left turns, anything other than straight ahead. And it's based on what the traffic management system does.

MR. STEUDLE: All right. So then that negates the question because the question was -- well, but it is, because I do know that there's other communities that are looking at upgrading traffic signals.

I had a conversation with one major city that wanted to update their traffic signals. They want to know, what should I put in place? And we said put in an advanced traffic control room for now and wait. Because for anything you spend above that is gambling money. Maybe it works, maybe it doesn't.

MR. WEBB: The intelligent lighting system that they put in in Detroit, that has the ability to actually transmit information too.

MR. STEUDLE: The one in the city, I don't know what their communications is. The one that's on ours has limited capability.

MR. WEBB: Okay. Okay.

MR. STEUDLE: The one that's on the freeways.

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MR. McCORMICK: Go ahead.

MR. WEBB: Yes, I just wanted to, I've heard a couple of comments from the people involved in the pilots. And one of the things that really struck me, and this was where I was dealing with the county as far as being able to provide something, was that the comments seem to be they went in thinking that the technology and equipment was further along as far as standards and apps and so forth. And have learned a real serious lesson as they're in the process of having to, in effect, develop that instead of taking it.

So, you know, again when we're talking about deployment, for somebody like the city that you just mentioned or something like that, you know, trying to get a quick understanding of what is or is not out there would be a very, very valuable thing to decide, you know, this is where we are. And maybe waiting a little bit longer for the pilots to come to fruition as far as bringing information out there would be a very good message to get out to people who are trying to get into this.

MR. STEUDLE: It was a city in Florida, by the way.

MR. McCORMICK: Yes, the only problem with that

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is that it reports every three months because it's very quickly outdated.

MR. STEUDLE: Right.

MR. WEBB: But all I'm saying is that, you know, it was a surprise to me and it was certainly a surprise to the consultants, you know, because they were having to look that up. Yes.

MR. McCORMICK: Okay. Well having said that, you know, like I said, I don't want to, other than advocating for funding, you know, to ensure that these areas are covered, talking about the deployment and ensuring that it covers the spectrum, not just the V2V, but the V2X, the V2P, the other V2I areas, is something we can certainly make a recommendation on.

DIRECTOR LEONARD: Well, Scott, I suggested this earlier. Let me bounce it off of you.

We're all waiting to see the NPRM action. And I don't guess what Congress is going to do. And I don't guess, I can't guess when the NPRM's going to come out.

But I do think one of the things the committee could consider, or advise the JPO on, is what do we do if we don't see the NPRM? What are our deployment strategies in

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the absence of an NPRM?

You know, is it truly game over? Or is it regroup and figure out how? You know, what if, what if FCC moves forward and says you have to share the spectrum? Or we have to re-channel the spectrum? Does that mean game over, we give up on safety, collision avoidance and connected vehicles? Or do we say, well, now how do we use 160 megabit messages? How do we use a rechanneled spectrum?

And again, our objective isn't to ensure that the videos get through, our objective is to ensure collision avoidance.

MR. McCORMICK: Yes, well --

DIRECTOR LEONARD: And we are, we can use the entirety of the unlicensed spectrum to do that. So my question would be what inventory do you --

MR. McCORMICK: Well, the thing is, I mean that's a valid point. That's a valid point. But the issue is that we can, at least in this community, have a very myopic view of what the technology is getting used for. In China they're using advanced LTE for a replacement of DSRC.

Because for most of the time, unless you're right in front of me in the car, or coming right at me, it's just

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as good. 20 milliseconds is just enough so I can see you.

And they have a different perspective on what it is they're trying to accomplish; right? They're not concerned about individual safety, they're concerned about maintaining the maximum flow of traffic. Sorry, they just are.

You know, in the United States if you have an accident, somebody will send a first responder to help you and get you off traffic. In China, the first thing they send is a tow truck to get you the hell off the road so the rest of the traffic can keep going. Right? And it is what it is.

So the technology is something that, if we don't have this optimal choice, there are sub-optimal choices. And I'm sure everybody can figure out how to make it work. Not as good as, but probably good enough.

So, my question, next question to you is going to be, well, okay, if we don't get this announcement made by January 20th, is there a forecast of how long the delay will be before somebody has to put their signature on it or understand it?

Our board looked at it and said, well, it's going to be, you know, anywhere from 9 to 12 months minimum. If

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it isn't done before the 20th, that's not going to stop his deployment of the CTS, you know.

And the other thing is that historically rulemakings are made to get the last 20 percent on board. You know, a rulemaking is typically 80, 75 - 80 percent of whatever you're trying to rulemake, the industry's already gone and done it. And you're really now trying to close it out and say, Okay, now all of you do it. Right?

This is one of those rare cases where the rulemaking comes before all that. And before even some basic questions are answered.

So in this case I don't know that we can forecast how the problem, what's going to happen, what the world's going to do if it doesn't go forward. We're committed, I think the industry is committed, and I think the infrastructure side appreciates the benefit of doing this, to say that if the rulemaking doesn't happen in January, John, are you guys not going to put out? I mean you may not deploy real quickly all the models, but are you going to not deploy?

MR. CAPP: At this point, so I mean I was trying to speak for us and trying to give what I think is the industry perspective. We're putting our toe in the water on this one

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vehicle. We're beginning to sell the car. And we're continuing to work collaboratively.

And just like Kirk said, the agents, the various agencies, you know, groups and agencies and so forth, they might get their toe in a little bit. But nobody, nobody's going to go all in --

MR. McCORMICK: Right.

MR. CAPP: -- on something unless we know that it's certain. So if the NPRM doesn't come out, and even if it does, who knows if it's going to sit for a year. We've had NPRMs that have never seen the light of day in terms of a final rule.

MR. McCORMICK: Right.

MR. CAPP: So I think what we were talking about earlier on the different technologies and the spectrum alternatives and, you know, Ken brought it up again, should we, you know, think about or just have a line of sight on what are the work streams that keep the mission alive, regardless. Because it's not certain.

MR. McCORMICK: Because the mission is to get to zero deaths.

MR. CAPP: Right.

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MR. McCORMICK: Right. The mission isn't to deploy DSRC, the mission is how do we get down to zero.

DIRECTOR LEONARD: Right. Well, you've got 5 to 6 million collisions; 2.5 or 3 million injuries; 35,000 fatalities. That, that is how do we continue to address that without an NPRM?

I do view the NPRM the way you do. You know, because there is normally you would plan the rule to catch the tail end. In this case it's to create a common environment to reduce the risk to the industry so that they can move forward and do that 50 or 80 percent and demonstrate the benefit.

This is one of those things where, you know, we all understand if you don't set up the environment so you have the interoperability, then you have a very piecemeal implementation.

MR. BELCHER: Well, you've got to be careful. You have to be careful when you do this. So if we write, okay, if we don't get an NPRM, here are the work streams. And we're going -- you know. And it looks like you can do it without the NPRM --

CHAIR WILKERSON: Yes.

MR. BELCHER: -- I mean we have to be really careful about that.

MR. CAPP: Yes, yes, yes, yes. We don't want to be telegraphing that we're planning for Plan B. We never want to do that.

MR. McCORMICK: Right.

MR. CAPP: But in the context of research, I mean there are these other schemes going on. You say, hey, can we use other, other approaches to, you know, to accomplish some of the same things? And those are fair research questions.

MR. McCORMICK: I mean I've been doing this for a long time. I incorporated the VII construction for the first time back in 2004. You know, and Scott Andrews and I wrote the cooperative agreement that got them the \$54 million.

Industry is behind moving forward to get to that vision of zero deaths. If this is the vehicle that helps move us forward, the DSRC, I mean that's the horse we're going to ride. Right?

If it's not, they still want to get there because it's now come to the point that safety sells. Okay. It's

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now come to the point that it provides them with a number of things in terms of access into the car that enables different business channels that they didn't have before.

It incurs risk. You know, we have an opportunity to learn a lot of new things. But from -- and I speak all over the world on this topic and over the years more and more places are getting on board. I mean it's to the point where India and Morocco want to know how to do it because they have deaths.

So whether we have one particular protocol that becomes the final solution or not, or even temporarily 'til another technology is available, the world wants us to go there. You know, as long as I've been doing this, we're going to keep moving there.

PROFESSOR RAJKUMAR: So, to me the NPRM will deploy. The other uncertainty on top of the development is city side or the county side. We have very limited resources, nobody wants to invest money in another Betamax.

MR. McCORMICK: Right.

DIRECTOR LEONARD: And I think we're all in agreement, in order to move towards zero deaths, what we need is connectivity, it needs to be uninterrupted. And it has

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to carry the original safety message that the operator can act on, or if the operator is an automated vehicle, that it can act on in the long term.

But in the near term, I'm not suggesting a, you know, completely abandoning that concept of using connectivity, but I'm saying, you know, we talked a little bit about voluntary approach. What would we have to do, what would it take to set up that kind of environment?

What research would we have to do to explore how to exploit unlicensed spectrum in which there was interference in the 75 megahertz? How much of the other unlicensed spectrum would we have to exploit to make sure that messages got through?

What would we have to change about DSRC devices so that now they're receiving safety messages across multiple channels?

MR. McCORMICK: That's actually fairly simple. I mean because right now it's --

DIRECTOR LEONARD: It's fairly simple but --

MR. McCORMICK: -- it's a tuning.

DIRECTOR LEONARD: -- it's work that we could not just turn around and say, okay, everybody, go implement it

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without --

MR. McCORMICK: Right.

DIRECTOR LEONARD: -- a body of work that says it's not our concern whether or not you're selling subscriptions on this channel or whether people are getting better internet. It's our concern whether people aren't getting entertained to death, that they're getting the safety messages.

How do we exploit that different world? How do we make sure that the messages get through if we don't have dedicated 75 megahertz?

And, again, it's up to the committee to tell us if they think this is worthwhile, or if they think it's a bad idea. But I'm saying is it voluntary, you know, industry voluntarily committing to move forward in the absence of an NPRM?

MR. McCORMICK: Much heightened risk and less uncertainty.

MR. CAPP: Here's my perspective. I think the voluntary model has good precedence, recent momentum. NPRM, had it come out yesterday, I was fully expecting that before the end of the administration we would get contacted by Dr.

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Rosekind and says, Hey, NPRM's out. The industry guys have been asking for it. Get everybody in a room together and work toward a voluntary agreement.

And I think we would have said, sure, let's do it.

And I already had this conversation with some of the other OEMs. And I think and in that context, sure, we'll work with you, we'll talk about it.

In the absence of it, it's really hard to get a voluntary agreement if we're now creating all these standards and stuff all over again. I am not that optimistic that if we lose the NPRM here, that another solution that everybody could buy into and deploy in the vehicles is just around the corner. I think they could do it, but I think it would be a significant delay.

MR. McCORMICK: Oh yes. I don't want to trivialize that it would take time and effort and money.

PROFESSOR RAJKUMAR: Here's the way I see it. For example, I expect if the FCC would come up with a compromise of some kind, so that both sides of the argument would work together. But there are two different solutions, I believe, one from Cisco, one from Qualcomm. They are two different solutions. And depending upon what the component

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structure would be, the end results may be very different.

On the other side, if it comes out to be nothing, it just completely goes away, in which case we go back and look at intelligence of software, different radios. We can still look at unused space on the fly and do something useful. Again, it ends up being very difficult models.

MR. CAPP: Maybe you get there the same way, but in terms of everybody on the same page, same rules, same messages, you know, then you have a shot at it. But, you know, it's out of our control; right?

The only question on the table is the work you want to do to -- you know, I'd hate to invest in a completely different direction, but maybe in a slightly different direction like maybe, maybe we do have to live with sharing. And maybe we do have to live with -- Are we satisfied that the program has enough work in there to keep, to keep us going in the right direction?

PROFESSOR RAJKUMAR: And the timing is critical, too, because a company to do all this work is going to take years. Couple years. So maybe the five vehicles come into play. And of course they have revenues expectations, of course.

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MS. QUIGLEY: I just wanted everybody to know I'm on Sirius FM's trucker radio station taking calls from truckers. And what they want more than anything is more technology to help make their trips, especially in rural America, make their trips safer.

(Simultaneous speaking.)

PROFESSOR RAJKUMAR: So I don't know if we answered that question or not.

MR. McCORMICK: I think we actually kind of morphed over into the next bullet which was the NPRM briefing on V2V and the JPO discussion on the elements of automatic braking.

You guys have already gotten together and said by some period in 2021 --

MR. CAPP: So what is that one? What does that mean?

MR. McCORMICK: I don't know. I think it was a -- I mean from my memory, which is failing in my old age, the NPRM group, we've asked for a brief at this period where we were on the NPRM for V2V. And the answer is, I don't know.

MR. CAPP: The answer is it's not out yet.

MR. McCORMICK: It's not out yet. There was a --

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DIRECTOR LEONARD: I don't know if everybody realized, so I was in the White House most of the year and we understandably left, right, with a bunch of suggestions, corrections and edits.

MR. McCORMICK: Right.

DIRECTOR LEONARD: And I think it's made its way back from there with the pictures and the I's and T's corrected, back to the White House so that an announcement could come out whenever they want. Right? That's the way I understand it.

(Simultaneous speaking.)

DIRECTOR LEONARD: That's my understanding, right, if the technical work has all been done and the negotiation, now it's just a matter of whether they actually do it.

MR. CAPP: It has been over there for a long time. And since approximately January. And this is all a matter of public record. And I continue to be optimistic that we'll see some action on it.

MR. McCORMICK: Yes. And the only OEM influence you're talking about, I think that went in August and --

DIRECTOR LEONARD: My own comment was directed at

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the fact that by the time this committee meets again, we will be in the new administration.

MR. McCORMICK: Right.

DIRECTOR LEONARD: And we will know decisively whether or not this administration was accurate or not. And then --

MR. McCORMICK: And whether we're having another meeting.

DIRECTOR LEONARD: And the answer will either be yes or no. And we should be thinking about, in either case, what our task really is.

MR. McCORMICK: And the other point on the automated braking was that that had just come out or was recently out. And so the thing is, they wanted to know if it would be worthwhile having a discussion understanding what that agreement was.

All I know is that the automated results said it's about 2021 we'd all have automated braking. But I don't really know what that means.

MR. CAPP: Yes. Well, we agreed, you know, we took the test protocols that exist -- so we've got to go back to the drawing board to try to figure out stuff that doesn't

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exist. So we were challenged by the IHS and by NTSA, who said, hey, we've seen benefits in the field. The industry challenge is that you work with us to develop a common agreement. Some reluctantly, some more positively said yes. And then we helped get the ones who were reluctant to come along to make it, to make it doable to pick, you know, known stuff.

That's, for an example, the new protocol. Pick known test procedures, known technologies, write an agreement.

They said, all right, we're basically going to use existing IHS test protocols that are still there. And part of the NHTSA's protocol for NCAP. And we build our own little standard around those existing protocols. And say by December of 2022 all light vehicles will have it, nearly all, 95 percent what we agreed to. And then some heavy duty trucks, up to 10,000 DPI, three years later.

Two page memo. And the company sent a letter to NHTSA that will be reported and put out in the public domain every fall with a percentage of the vehicle domain. And it's done.

Took a little bit of work but not so bad.

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MR. McCORMICK: All right, good. Thank you.

And, finally, the procurement one was actually the one we had for funding employment. That's in there twice, Sheryl. So I can skip that one?

CHAIR WILKERSON: Yes.

MR. McCORMICK: The last one we had was talking about speakers that the committee would like to have. And these were the -- I wanted Kirk to speak. And then there was AAA, APTA, the League of Bicyclists, NAMA. There was a lot of interest about understanding the non-vehicular road users, regardless whether they were motorized or not, regardless whether it was urban or rural.

And other than having Peter here, I'll declare victory on that one. I think what we need to figure out is do the first things on employment and the roadmap and figure out where there's areas of information we might need to fill in our gaps to flesh that out.

With that I'll turn it back to you, Sheryl.

CHAIR WILKERSON: Sure. Joe, did you want to say anything or, hey, Calabrese down there, you seem a little quiet.

MR. CALABRESE: I have been quiet. I've been a

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doing a lot of work today.

CHAIR WILKERSON: No, I just wondered if you had any contribution --

MR. CALABRESE: No.

CHAIR WILKERSON: -- that you might want to add before we close this thing.

DR. SHAHEEN: Yes. So, you know, I think the issue about the transportation is really important. And as I mentioned before, I think the resource of Linda Bailey could come in to, to brief on that as well.

I think making sure that we're representing cyclists is critical, along with public transport.

CHAIR WILKERSON: Okay. Okay, any other comments?

(No audible response.)

CHAIR WILKERSON: Okay, so thank you. We're actually a little early.

The only thing we have left on the agenda was a discussion of the action items and the next meeting.

So I thought maybe we could pull up that timeline, if that would be helpful.

And, Tina, did you put it on the table or for our

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timeline? I noticed that we're waiting for all the things that happen in the office and the transition team and other things. But we're going to keep moving down our track.

Right now, if we wanted to -- and this has always been optional. There have been several advisory committees who did not provide an advice memo in past years. I think there were two years that were skipped, if I'm correct.

MR. GLASSCOCK: Yes.

CHAIR WILKERSON: Three? Okay. But technically the time frame would be around January/February, I would guess. Right? We have a lot of leeway.

MR. GLASSCOCK: Yes. I mean you submit an advice memo. It's just can tell --

CHAIR WILKERSON: Yes.

MR. GLASSCOCK: -- it can just contain what you have deliberated, talked about considering now. And then you note that your recommendations will follow in the next advice memo.

MR. DENARO: Sometimes you just create like --

MR. GLASSCOCK: A summary.

MR. DENARO: -- narrative.

CHAIR WILKERSON: Yes. Right.

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MR. DENARO: We didn't have recommendations or anything.

MR. GLASSCOCK: Right.

MR. DENARO: It was like a page-and-a-half or something. Here's where we're going.

MR. GLASSCOCK: And that's sufficient.

CHAIR WILKERSON: Right.

MR. McCORMICK: That's what I would vote for.

CHAIR WILKERSON: So that's something. And I think in light of the conversation we just had, it might be relevant in light of the fact that the new administration is coming on.

MR. McCORMICK: Right.

CHAIR WILKERSON: And to tee up other things about what we plan to do for the coming period, you know, in terms of --

MS. QUIGLEY: Yes.

CHAIR WILKERSON: -- what our expectations are. So we might want to talk about that.

And the other dates you see here are much further along, the May date.

And then lastly when we first started the meeting,

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I mentioned that we might want to have a conference call sometime in January/February. And then maybe look to having a first meeting late March or early April. And that should give us some flexibility.

MR. McCORMICK: Right.

CHAIR WILKERSON: Any thoughts on this? Scott just commented about the advice memo. I would welcome some sort of advice memo -- memorandum summarizing along the lines we just discussed.

PARTICIPANT: And then I talked about an interest in getting --

CHAIR WILKERSON: Okay. Okay, great.

Okay, so any -- the floor is open for discussion on that. We're to set the agenda. Just looking to you guys to supply some thoughts.

MR. GLASSCOCK: I will give you an update on your appointments. They are still waiting for the Secretary's signature. So we hope that he will sign them before he leaves, but there is no guarantee.

But, you know, in the charter it clearly states that you can continue to serve until --

MR. McCORMICK: Right.

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MR. GLASSCOCK: -- replaced, or, you know. So I appreciate that everyone is willing to continue work.

MR. McCORMICK: Is there anyone that's new?

MR. GLASSCOCK: Yes. So we have two vacant seats. And we can't seat those positions until the Secretary signs.

CHAIR WILKERSON: The Secretary signs. Yes.

MR. McCORMICK: No, I meant is there anyone from the 2016 to '18 appointment that wasn't here in the '14 to '16?

MR. GLASSCOCK: Yes. Two people.

MR. McCORMICK: Oh, two people. Okay.

MR. BELCHER: Sheryl.

CHAIR WILKERSON: Yes?

MR. BELCHER: Just based on the conversation, it seems that it probably makes sense to do an advice memo, but to do it in February and to do it fairly short and fairly succinct, so that it makes its way up to the front office as well to be reviewed. Just to reiterate some of the comments that we talked about.

CHAIR WILKERSON: Yes.

MR. BELCHER: Not any new work.

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CHAIR WILKERSON: Yes.

MR. BELCHER: But simply a summary of the points that we think are important.

CHAIR WILKERSON: Yes.

MR. McCORMICK: Plus it acts as an informative letter to the incoming Secretary.

CHAIR WILKERSON: Right. Right.

MS. JOHNSON: I support that as well.

CHAIR WILKERSON: Okay.

Are there maybe three or four people who might want to take a stab at drafting that outline? Just --

MR. GLASSCOCK: Yes. Also there's the, there's two advice memos that you have provided, or the committees have provided that just capture an overall summary of what you've been doing. And so it would be an easier thing to do --

CHAIR WILKERSON: Yes.

MR. GLASSCOCK: -- to use those as a template, you know, so you won't have to recreate the wheel. Right?

MR. McCORMICK: I'll throw my head in to help whoever wants to do it.

CHAIR WILKERSON: Scott. Anyone else?

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MR. McCORMICK: If no one else wants to help, I take my head back.

MS. QUIGLEY: I'll work with you. Would I be of value to you?

MR. McCORMICK: Of course. You're great.

MS. QUIGLEY: Well, I don't know if I would be of value, although I would love to help out.

MR. McCORMICK: Well, but I'm not going to tell you if you're drinking now.

MS. QUIGLEY: Oh.

(Laughter.)

CHAIR WILKERSON: Comments are on the record.

(Laughter.)

MS. QUIGLEY: I don't know, I don't know if I'm the right person for that. But I'll be a third, I'll be a third for you.

MR. McCORMICK: Well, I think we ought to be able --

MS. QUIGLEY: Well, we've got to pass the memo. So it would be a matter of doing what Peter said.

MR. McCORMICK: Right. I'm saying Bob has previous memos that were -- that are a framework for what to

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write. All we're really trying to capture is what we've said, --

CHAIR WILKERSON: We've done it before.

MR. McCORMICK: -- what we've gone over in these meetings and what we're going to pursue. So we're not looking at a treatise. You know, it's not that involved.

CHAIR WILKERSON: So how long does it take for the transcript.

MR. GLASSCOCK: So, well 10 working days he could have a clean version, a clean version.

CHAIR WILKERSON: So that would also be potentially a useful for this. So I don't think we'd need it, but just looking to clarify on it.

Maybe we could do a draft. So Tina, Scott and Bob?

MR. McCORMICK: And Bob's gone. And Bob's a draft on --

CHAIR WILKERSON: Okay, so Tina, Scott and Bob.

What about a proposed time line for you guys to send your draft to the committee? What would be --

MS. QUIGLEY: You think I'm the right person? Because I did miss the last part of the conversation.

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Because he was saying that --

I want to be helpful but I just might not --

MR. McCORMICK: You want it submitted by when?

CHAIR WILKERSON: No, but this again is a summary just highlighting what we've done to date.

MR. McCORMICK: Sheryl, you want it submitted by when?

CHAIR WILKERSON: Oh, February.

(Simultaneous speaking.)

MR. McCORMICK: After CES, would that be okay? CES ends January 8th. January 8th. So one week from that would be, say, January --

CHAIR WILKERSON: We could do it after the inauguration. Or we take January 20 --

MS. QUIGLEY: First.

CHAIR WILKERSON: The week, the following week after the inauguration.

MR. McCORMICK: Right. That week. So I'm thinking --

CHAIR WILKERSON: So how about January 23rd?

MR. McCORMICK: Okay.

CHAIR WILKERSON: You'd send a draft. And then

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we'll get that circulated for comments, preferably by the end of the month. So that gives everybody a week to look at it.

MR. McCORMICK: It's not going to be that long.

MS. QUIGLEY: No. No, no.

MR. McCORMICK: Two or three pages.

CHAIR WILKERSON: And then we'll target February 13th for a final draft. Is that fair?

So January 23rd for a draft to be circulated to the committee. Comments a week later. And then the goal would be to send a draft, a full, a final to Stephen and others by February 15th. Okay?

MR. McCORMICK: That sounds good.

CHAIR WILKERSON: All right. And in the meantime, the other issue is for next call, for another call.

So we could use that draft as an opportunity to order the topics for the discussion in the call, if you want to tweak that. There were some other things we said we would like to do, you know, for action items here.

MR. BELCHER: Well, by that time you'll know what the administration has done on the NPRM, and so we can talk about that.

MR. McCORMICK: Right.

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CHAIR WILKERSON: Right.

So a call late -- early February?

MR. McCORMICK: Yes, I think if the NPRM is not out, that that call should probably focus primarily on how, what are we doing going forward.

CHAIR WILKERSON: Well, we can come up with the itinerary. But we could look this draft as well.

MR. McCORMICK: Right.

CHAIR WILKERSON: As well as anything else anybody wants to put on the table.

So is there a target date or?

MR. McCORMICK: The first of January?

CHAIR WILKERSON: Well, first of February.

MR. McCORMICK: First of February, yes. Well, I mean I was just thinking a week after we submit that report, just do it then, you know.

CHAIR WILKERSON: The first week of February, does that work for folks, just as a window right now? And then we can do Survey Monkey or something. Okay.

All right. Well, we'll target that week for a call.

And then last thing, provided we are all still

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here and serving, we could discuss a proposed date, we've all got out calendars here, for a possible meeting sometime in March or April. Anyone want to point out weeks that we might not want to consider in light of industry meetings or holidays?

MR. McCORMICK: I'm putting together an annual events table, you know, letter of what all events are every month. So if you can give me a little time, I'll have, a week or so, I'll have that. I'll send it to you with what events are going on we can plan around.

Well, we want to make sure we're not doing it at an inopportune time for D.C. It can get expensive and crowded there during certain times of the year.

CHAIR WILKERSON: Any initial thoughts though about weeks?

MS. QUIGLEY: Yes. So the best week for me because of my heavy teaching situation is the week of spring break, which is March 27th to March 31st. So, I'll need to call in otherwise.

CHAIR WILKERSON: Okay.

MS. QUIGLEY: But total equal, that's what -- you know, if it doesn't work out, but.

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MR. McCORMICK: That should work.

CHAIR WILKERSON: Any thoughts about that as a possible week.

MR. McCORMICK: Last week of March?

CHAIR WILKERSON: Uh-huh.

MR. McCORMICK: Yes, we'll send out a Survey Monkey on it because I don't have my calendar in front of me.

CHAIR WILKERSON: Okay. So we'll look at that as a possible week. And then the first week of February for a call.

MS. QUIGLEY: Yes.

CHAIR WILKERSON: Is that fair?

MS. QUIGLEY: Uh-huh.

CHAIR WILKERSON: Okay. So that's great.

I was just going to highlight a few things. I know the others, in terms of the subcommittee follow-up, looking at some of my notes based on what Ken and others have said, I'm assuming the subcommittees would then at some point between now and in March would be meeting to have a conversation, maybe come up with a top two or three topics that they'd like to focus on.

And I'm just going to highlight a few things that

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we discussed as caveats to things that we should keep in mind.

One was the review, to review the summary of recommendations to make sure we're not duplicating efforts. So that has been circulated. But emails would be great, if each subcommittee could take a hard look at that, or each of us.

To review the 5-year strategic plan, provided it's released soon. I think the deadline was December 31st. So, hopefully, we will circulate that to everyone.

In your respective subcommittees, one of the things that Ken highlighted was keeping in mind what can the ITS JPO do? What is its proper role? How can it support the multi-modal view to support all of the various constituencies, and the advancements that are going on around the world which will help them communicate out to the new administration?

How can it best move away from certain specific issues? And I don't know if I articulated this well, but oversee a portfolio that doesn't quite have a full blueprint, right, at this juncture.

MR. McCORMICK: That's meaningful and relevant.

CHAIR WILKERSON: Uh-huh. Which we need for

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relevance.

Keeping in mind special needs, social equity, emergency response and cyber security.

We talked about a sort of schematic JPO chart for stakeholder engagement. Who are the other stakeholders? We talked about the Post Office and some others. But who are those top stakeholders that we should be focusing on? Because we said that the landscape was getting pretty broad.

And then what is the framework and fundamental blocks that we would recommend for the JPO to enable them to address the changing landscape? And I think that was Bryan's comment.

Another was development of a portal. And I don't know how we would entertain this, but a portal for including updates on advancements in technology in the states?

MR. McCORMICK: Well, I'm not sure why we can't, since there's not a way to use the affiliated test bed as that existing program. They'll exist, I mean it's just a different file that you're going to be putting that information in.

CHAIR WILKERSON: I'm just giving these issues. You can talk about them in your subcommittees. I'm not

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saying yes or no but just --

And then, lastly, keep an eye on Section 6004, Section 5, the 5-year program on how to address problems in this area.

Those were the real big issues.

And then outside of that were potential speakers for the next call. I was thinking that, you know, maybe that's a great time for us to have Linda Bailey and someone from NACTO.

And then we talked about the normative messaging, whether there was someone that Steve Alberts would want to recommend.

So we can include that in the Survey Monkey for topics for the next subject matter, I think. But those are the highlights I took away.

I open it to the floor. And then, if you have some comments?

MR. BELCHER: We might -- I think there was a comment earlier that we haven't had an update on JPO focus in the last couple of meetings. So that might be helpful.

CHAIR WILKERSON: Okay, I'll put that down.

Others? Debra?

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MS. JOHNSON: Well, I was going to say I think the update on JPO would be better suited for an in-person meeting.

But I also wanted to add, as it relates to the subcommittee, since there was a discussion about potential, you know, overlapping, clear cut similarities with some of the assets you want to see, that when we do get to our subcommittees we put it out to everybody in case there's others who may be interested in hearing whatever speaker --

MR. McCORMICK: Okay.

MS. JOHNSON: -- we deem to be appropriate because that information could be advantageous for the others as well.

CHAIR WILKERSON: Comments?

MR. DENARO: The other might be a speaker from NHTSA, like Matt Peterson, we've had before. As John said, a lot's happening rapidly in the industry. They published their automated vehicle (AV) guidance. It would be interesting to have a chat with them about that and other things.

CHAIR WILKERSON: Okay. Raj?

PROFESSOR RAJKUMAR: A couple months back when the Secretary announced the regulatory framework for AV, the

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authority started soliciting nominations for a committee of experts from --

CHAIR WILKERSON: Right.

PROFESSOR RAJKUMAR: It would be useful to know where the process is and where we can invite someone basically to make a presentation here, for example.

MR. LEONARD: Yes. I would certainly hope by the time of the next meeting we would -- that would be a standing committee to serve on.

MR. CAPP: How does that relate to this one, Ken?

MR. LEONARD: Well, the Department has a number of Federal Advisory Committees. This is a new one that's being created. So the only, you know, and the focus of this committee is on -- of that committee, I'm sorry, is solely on automation.

So when we talked about, when that was being conceived, that there was a little bit of overlap. But that's not necessarily a bad thing.

The only potential downside from this committee's perspective is I believe that committee, if you're a member of that FACA you cannot be a member of any other departmental FACA.

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MR. CAPP: That's correct.

MR. LEONARD: So if any of you put your names in -- if all of you put your names in and everybody moves over to that committee then we'll be completely re-staffing this committee. But, you know, I'm not anticipating that.

That's the only potential impact. Except to say that once that committee does stand up, there may be times when, to the extent that there is overlap, we want to share information.

MR. CAPP: The scope of that, I've gotten some input from some of our folks here that, I don't know whether it's the case or not, but that one has actually a broader focus in terms of advice. They just want to give advice to the ITS JPO program. That was kind of a much broader, further-reaching effort.

CHAIR WILKERSON: It's the Secretary's FACA on automation. So in that sense it would probably deal with things like drones. We don't tend to do FAA.

MR. McCORMICK: I'm actually familiar with that, John. The committee is on transportation automation because it has to do with transportation, whether that's train, ship, aircraft or vehicle.

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MR. CAPP: Yes. Yes, that was my read, too, when I read it.

MR. McCORMICK: I'm actually a nominee to the committee.

MR. CAPP: It's sometimes dealing with earlier problems.

MR. McCORMICK: Well, see I was factory chief and program manager for General Electric Aircraft Engines. Before that for Locomotive, and before that for Newport News Shipbuilding. So I have the first 25 years was actually almost under our nation, but it was only the last 16 here. Which is interesting because I'm only 22.

MR. LEONARD: One other speaker you might consider is Julie Knapp.

CHAIR WILKERSON: Okay. Love Julie.

MR. LEONARD: Yes.

CHAIR WILKERSON: That's great.

Okay. All right, well, anyone else have any other thoughts or comments? Otherwise I can adjourn the meeting.

(Whereupon, the above-entitled matter went off the record at 3:16 p.m.)

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