UNITED STATES DEPARTMENT OF TRANSPORTATION

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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TUESDAY
JULY 18, 2017

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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, Chairman, presiding.

PRESENT
SHERYL WILKERSON, Chairman; Vice President, Government Affairs, Michelin North America
STEVE ALBERT, Director, Western Transportation Institute, Montana State University
ROGER BERG, Vice President, North America R&D, DENSO International America, Inc.
ROBERT DENARO, Consultant, Intelligent Transportation Systems
DEBRA JOHNSON, Deputy Chief Executive Officer, Long Beach Transit
J. PETER KISSINGER, Consultant, Intelligent Transportation Systems
SCOTT McCORMICK, President, Connected Vehicle Trade Association
JOE McKINNEY, Executive Director, National Association of Development Organizations
TINA QUIGLEY, General Manager, Regional Transportation Commission of Southern Nevada
BRYAN SCHROMSKY, Director of Technology, Verizon Wireless

SUSAN SHAHEEN, Ph.D., Adjunct Professor, Civil and Environmental Engineering, University of California, Berkeley

ALSO PRESENT

KEN LEONARD, Director, Joint Program Office
EGAN SMITH, Managing Director, ITS Joint Program Office
JULIAN GEHMAN, V2X Alliance
ARIEL GOLD, ITS Joint Program Office
DEEPAK GOPALAKRISHNA, ICF
KATE HARTMAN, ITS Joint Program Office
KATHRYN MCGIRK, McAllister & Quinn
ERIC MILLER, Transportation Topics
ANITA RASAN, Mitsubishi Motors
ROBERT SHEEHAN, ITS Joint Program Office
JONATHAN WALKER, ITS Joint Program Office
WALTER WHITE, Verizon
AL STERN, Citizant

T-A-B-L-E O-F C-O-N-T-E-N-T-S

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

(8:29 a.m.)

CHAIR WILKERSON: Good morning, we'll go ahead and get started. First, good morning to the ITSPAC Committee and the ITS JPO Staff, and our guests. I see we have quite a few guests today.

Thank you all for traveling here today. We appreciate the support of the ITS JPO staff, especially Stephen Glasscock, our Designated Federal Officer who could not be here but was extremely helpful in helping to arrange the speakers that you all requested and for helping to put our draft agenda together. We send our thoughts and prayers to Stephen who is unable to attend due to a death in his family.

We are grateful for Egan Smith and Ken Leonard for being here today to support us and provide their insight and briefings. A special thank you also to all of you for your leadership.

As Committee Members, I appreciate all the documents that you've sent over the past few weeks and months in preparing for our discussion today and for documented consideration for our advisory memo that we will provide beginning in the year.

We have a few Members who are unable to attend today. I have, and please correct me, John Capp, Ron Medford, Danny Pleasant, Raj Rajkumar, Kirk Steudle and George Webb.

Are we missing anyone?

PARTICIPANT: Ginger.

MR. LEONARD: Yes, I think Ginger is only Wednesday.

CHAIR WILKERSON: Excuse me?

MR. LEONARD: Ginger is only going to be here tomorrow.

CHAIR WILKERSON: Okay, just tomorrow, thank you.

MR. LEONARD: And what about Joe Calabrese?

CHAIR WILKERSON: I think Joe was supposed to be here. Yes, early one day, 7/19. Okay. Thank you for that. So each of you have a copy of the agenda. Can we -- I'm sorry.

MEMBER MCCORMICK: Before we start, what I would like to do is when people get the card, we have one we're passing around, and just sign it. If somebody can find out if there's any --

MR. LEONARD: Yes, we have sent a message to Stephen and working through our Chief of Staff to see if we can get an answer. We're trying not to be too intrusive. For those of you who aren't aware, he lost his father this week after a protracted illness. So our thoughts go out to him. It would be very nice if people could sign the card.

CHAIR WILKERSON: We have that. We'll circulate it. Thank you. Are there any questions about the agenda? We have the agenda up there. It was circulated before the

meeting and there were no additional changes. We have two open slots for discussion of our subcommittee topics at 11:00 and 2:00, I believe.

And we can choose to begin the subcommittee presentations at that time. But I think we have a lot of flexibility between now and tomorrow. We've got a lot of TBDs, so we'll have plenty of opportunity.

My thoughts were that we would start with one of the sub-topics and see how we do going on, moving forward. And then we can, based on that, figure out how we might want to use that time for the remainder of the day. And then before we conclude today, think about how we might want to use that time, allocate that time for tomorrow's discussions.

We have, I know Scott McCormick has suggested, has to leave a little early for --

MEMBER MCCORMICK: Well, at the end of the day. I won't be here tomorrow.

CHAIR WILKERSON: So I think it might be beneficial to have him maybe begin his presentation at 11:00 if everyone is amenable to that. And then, let's see, you see our speakers here. We have the JPO update, that's a Q&A which was requested.

We have an update from Kate Hartman on the connected vehicle pilots which some of you had requested. And then we have another presentation from Bob Sheehan and Ariel

Gold later today. So, we've got a full day.

Before we begin, I would like to maybe have the folks who are visiting and attending today, maybe if you could stand up and maybe, or announce yourself and tell us your name and who you're with.

MS. GOLD: Hi, so I am Ariel Gold with the ITS JPO. I look forward to talking with you later today.

CHAIR WILKERSON: Thank you, Ariel.

MR. GEHMAN: I'm Julian Gehman with the V2X Alliance.

MR. GOPALAKRISHNA: Deepak Gopalakrishna, ICF.

MR. MILLER: I'm Eric Miller, I'm with Transport Topics.

MS. RASAN: I'm Anita Rasan, Mitsubishi Motors.

CHAIR WILKERSON: I'm sorry, what was the last?

MS. RASAN: Mitsubishi.

CHAIR WILKERSON: Mitsubishi, okay.

MR. WHITE: Hi, Walter White with Verizon.

CHAIR WILKERSON: Welcome.

MEMBER MCCORMICK: What does ICF stand for?

MR. LEONARD: It does not stand for anything right now. It used to be Inner City Fund, but they have got away from that.

MEMBER MCCORMICK: Thank you.

MR. LEONARD: So a Washington, DC area consulting

firm.

MR. LEONARD: Ah, okay.

CHAIR WILKERSON: Thank you. And thank you for being with us. We really appreciate your participation. So we have the JPO update.

MR. LEONARD: All right. You know, it's interesting that you said ICF didn't stand for anything because I didn't know if you knew the history. In the 1960s it was called the Inner City Fund.

The firm started during the Johnson administration to do work, a lot of what would have been considered at the time “smart city.” That kind of urban renovation, urban renewal, those kinds of issues.

And then they turned into a broad-based consulting firm, kind of like ITS when you think about it because here we are 40 years later and we're talking about smart cities and the ITS portfolio and how broad it is.

So I didn't prepare really any extensive remarks because I thought what I heard was what we were looking for was just kind of Q&A. You're going to hear today from several speakers from the JPO.

Kate Hartman is going to talk about our connected vehicle pilots program. Some folks here from ICF are working the Wyoming portion of that and it's just, I don't want to steal her thunder but it's proceeding quite well.

Ariel is going to talk about the data program which we're still spinning up. It's been a part of our strategic plan for some time. But there's a growing interest from the Secretary's office and also around the Department for where we're going with data broadly. And then of course we're very focused on ITS data and data applications.

And another program that I'm really excited about is our ATRI which is our Accessible Transportation Research program, which we asked that team to do a kind of a revamp of it because it has some good projects going but we asked them to take a much longer term look.

And so Bob Sheehan is going to be in to talk about the ATRI program and touch on how it relates to the whole concept of mobility on demand. So these are all three pretty important topics, it's not everything we're doing in ITS.

Like I said, I didn't mention smart cities and all that which is a major activity. Columbus continues to spin up, and of course it touches on all of these issues, accessible transportation, connected vehicles, automated vehicles.

Anyone here go to the AVS in San Francisco? I understand that they had about 1,500, 1,600 attendees. We sent, the Department sent 37 people because we usually try and send, we usually get requests for 30 to 40 people to go.

And this year we were approved to send 37.

And it was really fortunate because in some cases I understand there are a dozen or fifteen simultaneous sessions. So we're pulling together a readout for inside the Department, and we'll do a briefing for those who couldn't go. Inside the Department we'll do an internal webinar.

Myself, I didn't go. I was at an AASHTO conference talking about automated vehicles in Philadelphia. So at both ends of the country people were very interested --

PARTICIPANT: What was the one in San Francisco?

MR. LEONARD: AVS. It's a TRB automated vehicle symposium. This is their fifth or sixth year. It started six years ago with 100 people.

MEMBER SHAHEEN: Tiny, yes.

MR. LEONARD: And it's one of these, it has grown into transportation research board's second largest conference. And it's done jointly in partnership with the AUVSI which is the drone folks. So it's both the surface and the air side.

And I can only imagine, given where automated vehicles are going that it's going, as a conference, it's going to continue to grow. So just in summary, those are just a couple of the hot topics.

We're spending our money, we're anticipating, depending on what happens with some year-end obligations, we may actually carry over a little bit more than we anticipated because we thought we were going to make some awards in September that may not happen until October or November.

Our anticipated carryover was about $12 or $13 million, which for an R&D program is a good number. It gives us some flexibility, it gives some immediate use, resources to use at the start of the year before we typically get an appropriation. Because we do R&D, we can carry some of that over.

But we tailor what we obligate to make sure that those folks who have expiring funds are able to get their resources out and optimize the flow of funds out that way. But you know, we continue to improve our obligation rate at the end of the year.

When I came in, we were carrying over something like $60 or $65 million. And for me that's, it's a missed opportunity. The longer you take to get your money on task, the longer it takes to accomplish the task. So we're getting our carryover in the target area we want it.

So we're pretty happy with the way projects are moving forward and we're in the midst of formulating the '18 budget. And of course we don't know what Congress is going to give us in '18. We know what the President has proposed.

So it's a little bit of uncertainty in terms of the budget for '18, but we're continuing to do internal planning inside the department. I'm going to stop there and take questions.

MEMBER MCCORMICK: Are there any appointments that have been made since the last time we met that are worth noting?

MR. LEONARD: Meaning confirmations from Transportation?

MEMBER MCCORMICK: Yes.

MR. LEONARD: So I know there have been several announcements at FRA, Derek Kan. I believe he has done a hearing. He would be the Under Secretary, a gentleman from Lyft. And he is in the building, in a special assistant capacity. I'm not quite sure what his title is.

He is not confirmed as the Under Secretary, but I've had an opportunity to speak with him on the topic of automation. I understand he's quite interested in data.

I have not heard of a nominee for Assistant Secretary or for Federal Highways administrator, the two political appointees that I work most closely with. And that's as of this week there were no names that I had heard. But other parts of the Department are starting to get nominees.

MEMBER MCCORMICK: Have there been any other

Executive Orders that affect the administration in this area?

MR. LEONARD: Well, there have been quite a few Executive Orders. And of course we --

MEMBER MCCORMICK: That's why I said that affect us.

MR. LEONARD: Well yes, it's an interesting week for talking about “Buy American.” It doesn't tend to have a significant impact on ITS. I don't think --

CHAIR WILKERSON: But there's a report due I think in September, right, from all the agencies?

MR. LEONARD: Right, but I don't think we have any Buy America waivers. I mean, I know there are some parts of the Department that have certain infrastructure projects that require equipment that is not made in America.

And so they have to go through a waiver process. But I don't think we have anything that has an impact on the ITS program office portfolio. At least nothing that's been brought to my attention as an issue so far.

In terms of other Executive Orders, of course we wait to see how some things get implemented. There's a little bit of time from when the President signs something to when counsel and the entire chain of people who have to review it, and they're able to give guidance to staff, and direction.

So we haven't received any significant direction since the last meeting.

MEMBER MCCORMICK: And then my last question will be do you have any upcoming regulations that we are going to have to adhere to that we have to remove two to put in one?

MR. LEONARD: I believe all of the Department's regulations will have to adhere to that.

MEMBER MCCORMICK: Okay.

MR. LEONARD: And that is something we have to press. But I don't think that's new since we --

(Simultaneous speaking.)

MEMBER MCCORMICK: -- didn't know if you had any new regulations.

CHAIR WILKERSON: But the FAST Act requirements though are hindered a little bit in the time frames that some of the statutory deadlines that were in there. I don't know if they affect you all, but it's a big deal for some of us who are following the FAST Act implementation.

MR. LEONARD: And this is why we rely on our counsel and everybody to interpret what are the right actions for us to take.

CHAIR WILKERSON: I appreciate that.

MR. LEONARD: Any other questions or comments?

CHAIR WILKERSON: I know the last time we were here, Stephen said he took our document and it was being

considered for May, I think it was a May date, or a May report. Was there any update on that? I don't think so. Not that I recall.

MR. LEONARD: I do believe he has put in everything. I don't know if it has been posted to the website.

CHAIR WILKERSON: I haven't seen it.

MR. LEONARD: You know, one thing that does strike a little close to home, one change. As a Federal Advisory Committee, we have to do Federal Register notices. There are some internal processes that have changed. So for example, the Secretary herself now signs all the Federal Register notices for the advisory committees.

And so we're trying to make sure that that process runs fairly efficiently. We came a little close to the wire in terms of trying to get the signatures. So we're trying to make sure we get that back up the amount of time to make sure we get these things done in a timely fashion.

And I know Stephen was sweating a little bit to make sure that he didn't have to rearrange the advisory committee time one more time. But everything went off fairly well.

CHAIR WILKERSON: And we have a chart. I think we have the time frames that show the schedule. So the report was due for May which has been completed but not

posted. And then January 1 we have the advice memo due to ITS JPO which is what we're considering today and tomorrow.

MEMBER DENARO: At the last meeting, there was some uncertainty about whether the Secretary wanted to continue with the committee. Do you have any clarity on that?

MR. LEONARD: Well, this advisory committee is established in statute. And so I think what the Secretary was doing was looking at all of the advisory committees and her assistants were looking at all the advisory committees trying to understand what they did, how they operated, whether they were statutory, whether they were discretionary.

And it's not uncommon for a new team to come in and try and understand what's the ground that they're dealing with. You know, we've communicated information, we've shared the background, the statutory background on this committee, all of the bios that you've given us so that they know who the members are.

I've had conversations with the staff around how this committee functions and the fact that I think it's a very high-order functioning, good group of people who are able to make contributions. And I think that's, from our perspective that's the end of the story.

Now you know, the --

MEMBER MCCORMICK: Did we all get a letter

shortly after she was confirmed? I mean, I know I got a letter, you know, reinforcing that they still wanted this committee to go forward, be on it.

MEMBER BERG: Didn't we at one point consider some kind of history lesson or something to help the Secretary? Did we ever do that?

CHAIR WILKERSON: No, we just had discussed it. We didn't have an action item.

MEMBER BERG: Okay.

CHAIR WILKERSON: At least in my notes I don't have an action item.

MEMBER SHAHEEN: So there was a committee proposed, advisory committee proposed around automated vehicles.

MR. LEONARD: Proposed, convened, met on January 16th of '17.

MEMBER SHAHEEN: Is that still in place?

MR. LEONARD: As far as I know, it is still in place. I do not believe it has met. That committee is a discretionary committee that was established by Secretary Foxx under his authority to establish one, and it's not a legislatively established committee.

And so I honestly don't know the status of that, the review of that committee. But clearly, the Secretary has signed off on this committee reconvening. That's why

we're all here today. And I do think they're looking at issues like okay, so if automation is a part of ITS, what are we looking at with an automation committee.

And so I think those are things that I think the Secretary and her team will take under consideration. And if we get any governing guidance, we'll be happy to share it with you.

I can tell you that automation is an area of keen interest to the Secretary. If you just look at her public announcements, you know, she's talking about connectivity, she's talking about automation, she's talking about data.

So I kind of feel pretty good that we scoped out the right areas in terms of our strategic plan two years ago. It's resonating, I think it resonated with the previous administration, I think it's resonating with this one.

You know, some of the things that we're getting into in terms of machine learning and artificial intelligence, we're also seeing an interest there. And frankly the challenge we have as an office of 17 people and a budget of $100 million, really targeting the resources we have as effectively as possible on what is a very broad portfolio.

And even if you looked at the things that we deal with in the JPO, there is a world of ITS that we just can't

take on. And in a lot of cases we don't because we feel that there's industry already working in those areas. And our role may simply be to try and create national interoperability, not necessarily develop the technology at all, or support the development of the technology.

MEMBER MCCORMICK: My concern with that, particularly with the autonomous vehicle guidance, policy guidance, there was some difficult items in there, the most prominent of which was the recommendation that the AI makers provide the DOT with what the rules are and that the car is going to execute on and make decisions.

And it was clearly written by somebody that doesn't understand how artificial intelligence works because the final decision on what a machine decides is indiscernible at the end. It may be that your car and you end up making the same decision, but that's because of how the learning algorithms work within the artificial intelligence design.

Those kinds of statements put into policy guidance are very difficult for the industry because there isn't, it's not a rule-based system. They have some rules in it, but that's not how AI works.

And so hopefully they will, as they move down that path, they will, because it's not a well understood area for most people in general, right, let alone the

practitioners inside of the industry. So I was just hoping that we would have some, not necessarily us but that there would be some better ability to vet those documents before they're published with those kind of statements in them.

MR. LEONARD: Well, and I hear what you're saying. And I certainly agree that you want to get, you want as informed a document as possible. But I don't know how to get public comment prior to releasing it to the public for comment.

And that's really, you know, that policy document went out in September, and went through a public comment period. The Secretary has announced that, you know, she and her team are reviewing that policy document. And at the same time, the comment period has closed on it and NHTSA is reviewing that document.

With regard to artificial intelligence and machine learning, yes there are, I think it's an area that's not widely understood, certainly by the general population. I've read some documents in terms of artificial intelligence and machine learning that there are only, you know, fewer than 1,000 true experts in the country or around the world. And most of them are in the US.

But you know, the people who really understand how it works are few and far between, and generally working

on very applied instances of it, working in the self-driving space trying to make it work.

So we do have some expertise in the Department, but not teams of people the way say the car manufacturers or some of the software manufacturers would have people working to apply, develop a product, develop issues.

And so that's one of the reasons why documents I think go through public comment is it gives the auto makers and the experts in the field the opportunity to say well, you didn't get this right or you got that half right or this is okay but you really need to change the nuance of that meaning.

So you know, Nat Beuse is going to be here tomorrow to talk a little bit. And this would certainly be an area where you could ask him questions. I think what you're going to hear is that the policy is under review by the Department, and the Secretary has publicly said she would like to get revisions out in the coming months. And I would take her at her word.

MEMBER KISSINGER: To Roger's question about history, it was my understanding that we had decided as a committee it was important and take the opportunity to sort of highlight any previous recommendations that we thought we already made, but according to the attention of the new Secretary.

And I think last meeting we actually went through an exercise to sort of cull those out. And the ones that were in I think were distributed to the subcommittee. So I think the project is very much still under way.

MEMBER ALBERT: So the Secretary identified, and maybe in her confirmation, four kind of bullets, one of which was rural equity, rural/urban equity or rural focus. Is there anything you think that we should prepare for her regarding what's going on in rural areas beyond just the connected vehicle stuff?

MR. LEONARD: I think the Secretary has, and I'm trying to remember the part you're referring to from her testimony in January.

MEMBER ALBERT: The four bullets, the fourth one I know was rural.

MR. LEONARD: Okay, and I know she has spoken on rural issues and, you know, the three particular areas that I've heard her say over and over again was safety, of course, infrastructure, which is a very hot topic, and the future.

But then there are a number of other issues that she has spoken about, you know, that the need to make sure that kind of all communities are important, that we're addressing these issues for all communities.

And so again, I think it's up to the Committee to decide what they want to recommend to the Secretary. Certainly rural equities and the role of ITS in addressing some of those I think are important.

You know, we still, the statistics don't lie. Over 50 percent of fatalities happen in rural areas. And not all of that can be addressed by ITS, but I believe that connectivity, some of the applications that we've demonstrated that could help prevent rural, you know, single car run off road, curve speed issues, things like that that are addressed by ITS technology.

So I think there are opportunities there. I believe in the ATCMTD grants, rural is specifically called out. And as you know, that is a $60 million-a-year grant program, which we are in the midst of the second year's evaluations.

Every year we're required to say, well did we get enough applicants to award? I can assure you, we got more than enough applicants to award the full $60 million and we fully anticipate that we will award the $60 million.

One of the cash management issues we address every year is to make sure we transfer the $21 million into that pot of money so those awards can be made. And we're in the process of doing that because we want those funds to be prepared, be available as soon as awards are

ready to be made. And they will be made this year.

MEMBER ALBERT: We submitted, and we would be glad to take your money.

MR. LEONARD: You and quite a few other people. And so yes, looking forward to seeing all the successful awards being made.

CHAIR WILKERSON: Any other questions? Well, thank you for the JPO update, we really appreciate that.

MR. LEONARD: Always a pleasure.

CHAIR WILKERSON: So we're right on time. We should probably move to the connected vehicle pilot. Kate Hartman?

MR. SMITH: Kate Hartman is stuck in the elevator. We have to get her up on the 14th floor.

CHAIR WILKERSON: Okay, well we'll give her a few minutes.

I think, or maybe what -- well, no. There are a couple things I thought that we could put on the screen just as a reminder. I know in the past couple of meetings, we've had some questions about what's our role, what's our objective, is this in line and consistent with what we have been, our mandate.

So you'll see up on the screen its path, objectives and scope of activities as outlined in our charter. And then we also have, there's another one with

our, another slide behind that talks about the description of our duties, just as a reminder.

So I'll keep that up on the screen while we wait for Kate.

MEMBER JOHNSON: Can you go back a slide?

CHAIR WILKERSON: I'm sorry?

MEMBER JOHNSON: Can you go back to the first slide for a second?

CHAIR WILKERSON: Yes, of course. Go back. Sometimes it comes up where we have our vigorous discussion.

MEMBER JOHNSON: Right.

CHAIR WILKERSON: Right, Roger?

MEMBER MCCORMICK: While we're waiting, if I may, the US House panel is going to vote on self-driving car legislation on Wednesday. And it's a very sweeping proposal that would allow automakers to deploy up to 100,000 self-driving vehicles without meeting existing safety standards.

They would bar the states from imposing driverless car rules. That would be the first significant piece of legislation for self-driving cars. And all it requires, as I read it, is it's for automakers to submit safety assessment reports to regulators.

But it wouldn't require any pre-market

approval, the automakers would have to show that the cars would function as designed and contain fail-safe measures. That's going to be problematic with almost every state that has regulation now.

For example, Kirk Steudle will, when Uber came and asked about, you know, driving their self-driving vehicles out of state, Kirk approved it tentatively but he said that you realize you can only drive on 20 percent of our roads because 80 percent of the roads in the country are not paved or marked. And so --

MEMBER BERG: In Michigan.

MEMBER MCCORMICK: Correct, sorry. And most of it went that way in a lot of the Southeast. So you know, I'm not really clear how that's going to sit with the industry.

MR. LEONARD: We may manage intelligent transportation systems, but we're still working on elevators.

MS. HARTMAN: Well, crashes on the Southeast/Southwest Expressway that aren't cleared quickly, but I hope this is worth the wait. I'm Kate Hartman, I am here to talk to you about the Connected Vehicle Pilot program which I manage.

A couple shout-outs to some folks who are deep into managing it as well, Jonathan Walker who is on my

staff, manages the day-to-day activities of the New York project, and then Deepak Gopalakrishna who is actually with ICF and has been a wonderful, wonderful project partner out on the Wyoming project.

So next, do you have a --

(Simultaneous speaking.)

MS. HARTMAN: Okay, that's okay. I'll just stop. There you go. So this is a slide that you may remember seeing. It hasn't changed in several years because the goals of the CV pilot programs have remained consistent.

We're looking to spur early connected vehicle technology deployment, measure the benefits that we get from all these different things, and then resolve some of the deployment issues.

And boy, are we resolving deployment issues. I could stand up here, oh and Ariel Gold, I didn't even see Ariel over there. She has been instrumental in getting a lot of these technical issues worked through.

So we are -- actually have a plan, we're executing the plan, and working the plan, and staying with the plan. There's something about planning here that I think my boss kind of likes too. So we are on track and reaching our goals. Next slide.

So again, this is something that hasn't changed

since we've first been talking about this, and that's a good thing because it's a high-level schedule, phase one, concept development.

We actually kind of squeezed that a little and got a little bit ahead because we had such a fantastic team working on all three sites. If you remember, we have three CV pilot sites, in New York, Wyoming and Tampa, and I'll get into a lot more details because we have more details to talk about now.

But one of the, so that we have these three phases planned, the concept development, we're currently in the midst of the design build test, and the next phase will be to maintain and operate.

So phase one complete. We've had concept deployment presentations presented to the US DOT last summer. They all passed muster. They were all posted publically on our web page. If anyone has any desire to look through the PowerPoint and the documentation, I won't get into the nitty-gritty details, but absolutely every one of them was ready to go.

Again, we're right now technically in the middle of the system design documentation. Wyoming has had their walkthrough. Tampa and New York's are coming up with it in the next couple weeks. So we absolutely believe that this is going to continue to operate.

Probably kind of hard to see, but these are the three CV pilot sites. WYDOT is looking to reduce the number and severity of adverse weather-related incidents on I-80 which is a major freight corridor up in Wyoming.

It's really focused on the needs of the commercial vehicle operators, but it's also doing a lot of back office systems into the WYDOT transportation management center. So that has been a real learning experience.

They've also found quite a gem of a, I don't know even what to call Tony, the wizard of Wyoming who is just delving into all the types of interoperable, open code, sharing collaborative work environments that we have been trying to do in terms of getting connected vehicle deployment. We can talk more about that if anyone has specific questions.

New York City DOT, the theme there has always been if you can make it there, you can make it anywhere. They are focusing on safety and mobility down in New York City with V2V technology in midtown as well as central Brooklyn.

Tampa THEA focused on, we made a suggestion improving safety during morning commuting hours. They've got a reversible entryway into the downtown city. They also have some pedestrian issues that they are working to

solve.

So this is kind of an eye chart. This is the three CV pilot sites. And I know I'm blocking for a few folks. These are the applications broken out into the various kind of stovepipe areas.

Well one of the great things about these CV pilots, not only are the individual sites breaking down stovepipes, across the three sites we're breaking down stovepipes and working collaboratively together, documenting everything that we're doing, posting it as quickly as we can.

These slides I believe are available. They're actually up on our webpage. I'm happy to send them to you. We're not going into a whole lot of detail on that because I've got kind of the grand unveiling in a moment.

This is kind of the numbers and the fleet vehicles. So kind of a count of what's going on. Again, you can read these for yourselves, but you can see we've got, actually going through the planning process, the big number was New York with 10,000.

They went through the planning process, which is what we wanted them to do and the number is now 8,000, but we've got almost another 2,000 in the other two sites. So we're still, we can still climb to the 10,000 vehicle number which we still think is pretty darn good.

But as you see, we've got the differing types of fleets involved and the pedestrians. And it is a fairly ubiquitous type of activity there.

This is the information for getting, following up if you have any information. Again, I am the overall CV connected vehicle pilot program manager. I am actually also the site AOR for the Wyoming project, Jonathan with New York, and then Govind Vadakpat is the manager for the Tampa THEA.

And we are working collaboratively together. If you ask one of us who doesn't have the answer, they'll find the other one who does. Again, any questions on that, you can follow up, but before you ask, okay, go ahead.

PARTICIPANT: No, go ahead.

MS. HARTMAN: I was going to say I actually do have a big unveiling. You are the first public folks to see the videos from the three sites. This was a deliverable that we asked for the sites to do so that we can help share what was going on in a -- go ahead. So do you want to see the video?

(Video played.)

MS. HARTMAN: And there you go, our world premiere.

(Applause.)

MS. HARTMAN: The work of a lot of people have

gone into this. One thing that I do want us to also just reinforce, we are doing an independent evaluation and that is ramping up as well to collect data and evaluate it. And we have more information next time for how that's going. So with that, I'm open to questions.

MEMBER JOHNSON: Yes, I have a question. I appreciate what you said about the collection of data because I think that is key to any project in ascertaining whether it was successful.

But keeping that in mind, will you be doing some aspects of, like, aspects of difficulty? I mean, oftentimes we do these projects and everybody talks about how great it is. But during the start-up phase there could be some issues relative to ensuring that it happens in the manner in which we anticipate it to because those could be leveraged going forward and --

(Simultaneous speaking.)

MS. HARTMAN: Absolutely. Absolutely. And actually, one of the things that I am now gearing up to do, and we've got a couple little vignettes, but we're doing lessons learned.

We actually have a document up on our webpage for the phase one lessons learned where it was more about the procurement and the start up. But now we're going through some of the technical because we're in the

technical phase and we're starting to do little vignettes.

We haven't quite packaged them, but absolutely because that's one of the things, you're right, that often gets lost. We either do it, “yay” this is a great success, or it's kind of like oh, it didn't work, let's be quiet.

So I am trying to get that information. So I'm glad I've got an audience.

MEMBER JOHNSON: And just as a follow up too, what venue or conduits would be used to disseminate that information? Say for instance that there's a next round of this.

Will those types of things be shared potentially on the front end before someone applies so they have an understanding of the time commitment and maybe the resources, you know, an entity needs to leverage?

MS. HARTMAN: So yes.

MEMBER JOHNSON: Okay.

MS. HARTMAN: I say that, but I think we are all ears for ways to do that better because right now a lot of it is documenting it and posting it on our website. Folks don't necessarily know to go look at our website to tease out that information.

So that is one of the things that we are working with our partners up in highway operations and our communications and our PCB folks about how to get that

information out in a more digestible, understandable way, easy to access way.

MEMBER JOHNSON: So I would suggest just, like, a listserv. I'm on quite a few for the federal government. And sending those out to, you know, public entities and transit authorities, MPOs and things along the lines because there's a lot of people that, you know, keep track from government relations and regulatory aspects that patrol around for that information.

MS. HARTMAN: Yes. Any help and I --

MEMBER JOHNSON: Yes, I --

MS. HARTMAN: Any help on that because that is something we --

(Simultaneous speaking.)

MEMBER JOHNSON: I would love to --

MS. HARTMAN: I am much more focused on getting the technical work done and documenting it. But the whole outreach marketing stuff, I know I need help on it and I think --

(Simultaneous speaking.)

MEMBER JOHNSON: I think this is great. It's just disseminating information so more people know about it. And just like with the video, you know --

MS. HARTMAN: I'm not taking it as a criticism. I'm asking for help.

MEMBER JOHNSON: Okay, great. Thank you.

MS. HARTMAN: Steve, yes?

MEMBER ALBERT: A question on Wyoming, and I think it's a great project. But I'm surprised that you could -- let me rephrase that. Using sign structures and supplemental probes, seem to be a very, like, there would not be enough sign structures out there for hotspots. It would be difficult to get a fleet for additional market penetration. Any --

MS. HARTMAN: You mean getting the information or getting --

MEMBER ALBERT: Collecting --

(Simultaneous speaking.)

MS. HARTMAN: Yes, because the Wyoming team --

MEMBER ALBERT: Yes, I know Tony is --

(Off-microphone comment.)

MS. HARTMAN: Steve, I think where Depak's going with this is we know that and they have been reaching out, and they are getting more partners as we speak.

MEMBER ALBERT: I thought, you know --

(Simultaneous speaking.)

MS. HARTMAN: Again, if --

MEMBER ALBERT: In Wyoming you can go 100 miles and not see another sign structure.

(Simultaneous speaking.)

MR. GOPALAKRISHNA: -- of these things but we are, there's two things that I wanted to highlight. One is that we are using satellite communication, pilot information so that it's going to be all across for all 400 miles.

We also have a third party interface that we are providing to a whole host of data providers including others on that map. So while we have 400 vehicles that they're equipping, we expect connected vehicle-enabled trial information to be set for thousands of people that are on I-80.

MEMBER ALBERT: That's great.

MR. GOPALAKRISHNA: So the biggest reasons for the RSU is to get the information back from the snow plows and they are running very localized routes. They have sensors, and they send that information back to the DMC.

MEMBER ALBERT: Thank you. And I didn't mean it as a criticism --

(Simultaneous speaking.)

MEMBER MCCORMICK: Can I go back a couple of slides to your application page? What struck me about this was that, and this is all, for those that may not recognize it, these are all specific line items within the connected vehicle reference implementation architecture, is that when you look at, particularly New York City's,

you actually have more capability because if you can do courtesy compliance and red light violation, the constituent elements that it takes to build those two actually allows you to do left turn assist.

MR. WALKER: Yes.

MEMBER MCCORMICK: Okay, so one of my suggestions would be to consider looking at, you know, what all that toolbox is that you have, that even though they have to be part of this particular implementation that you're able to do without any additional investment.

MS. HARTMAN: Okay, fair enough. And Jonathan?

MR. WALKER: Yes?

MS. HARTMAN: Noted, right?

MR. WALKER: Yes, sir.

MS. HARTMAN: Yes?

MEMBER KISSINGER: Can you go to the first line that had the schedule?

(Simultaneous speaking.)

MEMBER KISSINGER: Just discuss how the landscape relates to any planned regulatory action. I mean --

MS. HARTMAN: Oh, now you can speak, Egan.

MR. SMITH: Well, this goes to Debra's question and then I'll --

MS. HARTMAN: Okay. So I'm sorry.

MR. SMITH: Yes, Kate is alluding to the PCB program where we try and capture all the information that's coming out of the CV pilots.

Mr. LEONARD: PCB is professional capacity building.

MS. HARTMAN: Capacity building. Training.

(Simultaneous speaking.)

MR. SMITH: -- professional capacity building, yes. And the idea is to do just that, is to capture all the information that's coming out. Not just the technical side but the actual planning piece of it as well, and introduction to the project itself because we see this as an opportunity to try to sell these sort of ideas programs as part of the broader federal aid program structure so you can go out for the federal aid program dollars, the $40 million that's awarded, you know, every year.

So that said, that's part of capturing it. But we are also trying to get to a broader list of stakeholders, what we call the usual suspects and the unusual suspects. So we're always looking for folks to kind of guide us in the direction of who we should be trying to reach out to actively as well.

So that's a really important point you raised, and we'll try to follow up on that to get some additional information.

MR. LEONARD: What was Peter's question?

MEMBER KISSINGER: I just was curious as how if you were to lay the estimated regulatory time frame on top of this, you know, how would --

MR. LEONARD: Is there an opportunity?

MEMBER KISSINGER: Yes, maybe yes at this point?

MS. SMITH: Oh, I don't think we want to do that.

MEMBER KISSINGER: Or what the plan is? I mean is there a plan that --

(Simultaneous speaking.)

MEMBER KISSINGER: -- there is automatically a rulemaking in place or you can start the rulemaking or rulemakings or --

MR. LEONARD: Well, I'm waiting for his answer.

(Laughter.)

MR. LEONARD: Yes, I mentioned that Nat Beuse from NHTSA is going to be here tomorrow.

MS. HARTMAN: That sounds like a great question for Nat, because --

MR. LEONARD: And he might want to talk to the regulatory timeframe.

MEMBER KISSINGER: But from your perspective what makes the most sense?

MR. LEONARD: Well, let me step back a little bit, because when Kate proposed the pilot program we had actually envisioned a second wave, so this is the first wave of pilots.

And we have actually talked about a second wave of pilots which that plan changed when we launched Smart Cities and when the ATCMTD $60 million grant program came to be part because of budget realities you couldn't fund all of those things and fund a second wave and we didn't want to start a second wave prematurely because we felt that it was very important to go through these three stages, including doing some of the evaluation of it before launching the next set of activities.

And so, you know, I can't tell you where we'll be at the end of this process except that we know we'll have multiple ATCMTD grants out, we'll be further along in the CV pilot activity in Columbus, and so I think, you know, as we get towards the end of Phase 3 here we are going to be having to figure out where we are going in terms of national deployment.

I think the question, the challenging question, is how critical is a regulation to national deployment and to what extent are there other means for us to get to -- You know, the goal here isn't to deploy connected vehicles DSRC technology, the goal here is to get to collision

avoidance.

There are six million collisions a year, over three million injuries, I think we're unofficially approaching 40,000 fatalities a year. The numbers are definitely moving in the wrong direction.

Our premise has been that DSRC technology, connected vehicle technologies, are important to addressing that issue. And so if we are facing a time where regulatory solutions are not admired as much then we have to look at how do we achieve collision avoidance and, if necessary, how do we achieve connectivity in the absence of a regulatory environment.

And so actually that is a topic that this Advisory Committee could weigh in on and could offer insights into and to advise the Secretary and her team because I think those are some of the realities that we are seeing that's very clearly, I think Scott talked about the Executive Orders and the two for one on regulations and if that's the environment that we are dealing in and our objective has not changed how do we change that collision avoidance picture, what are the best ways to deploy ITS resources.

So we are showing people a technology, a way that works, but we are not saying that this is the only technology that can help pulling down those collisions, or

even the only way to get the connectivity.

But over the next few years and over the next few decades how do we achieve that end. Everybody is embracing towards zero deaths, you know, in different flavors and at different levels, at the State level, at the local level, Vision Zero, there are two or three different incarnations of that concept.

If we say that that's the goal, how do we use connectivity, how do we use this technologies, how does it get deployed at the State level.

Kirk Steudle is not here today, but if he were here I think he would speak up about what Michigan is doing with State resources to bring connectivity into the State and to deploy this kind of technology.

And if you want to address rural deaths and rural collisions I don't know of any other technology that industry is bringing forward that could do the kinds of things we believe that this technology is demonstrating in three very distinct environments.

PARTICIPANT: And just to add quickly to Ken's point as well, and remember it's not just the technology, it's the processes that we are going to learn from this exercise.

Tampa and Wyoming, for example, gave us connection to the TMCs, the old ITS strategies, so it is

finally the old and the new together that's key to really solving the overall system, transportation system, performance problem, and not just the connectivity in terms of the specific technology.

MS. HARTMAN: Yes. And I can't say enough about the way these three pilot sites have been cooperative with working together to resolve technical issues.

It has been amazing and, you know, my hat is off to the teams and the way they have been working to resolve those, because this hasn't been without challenges, but there are these thrown in and everybody is -- the three sites are coming out with different thoughts, ideas, projects, you know, bosses that want things done and they are working to get this deployment working.

MR. LEONARD: Well, they are also working in succession with, for example, the pilots, while they are all working together, they are also sharing that knowledge with Columbus as a Smart City entity.

We are trying to make sure that as we put resources into developing this knowledge that we are, you know, to Debra's earlier point, finding ways to share it with those who are interested in understanding what has worked well and what has not worked so well out of the emergence of new technology.

(Simultaneous speaking.)

MS. HARTMAN: I think Susan was next.

MEMBER SHAHEEN: Are you sure?

MS. HARTMAN: Yes. And then Bob.

MEMBER SHAHEEN: Okay. So, okay, thanks very much for the presentation, it was very, very instructive.

So I am not going to ask you a technical question, which I know you said was more your focus, but --

(Simultaneous speaking.)

MEMBER SHAHEEN: -- I am particularly interested in the behavioral response aspects of this, right, so how do we change collision avoidance technology via connectivity, how do we achieve higher safety, right?

So I think a lot of this comes down to how much the user takes into consideration the information that is being presented. So what I am really curious about is how are we going to get a causality and a context of the evaluation to show that if there is a behavioral shift it was, in fact, due to the information that was received.

MS. HARTMAN: And teasing that out, yes.

MEMBER SHAHEEN: And teasing that out. And I was, you know, particularly curious about, you know, how the research is being done on that human factors behavioral response side.

I know that in the Tampa video it was discussed

I think in the second video that there are drivers who are volunteering, but I was just, you know, curious about how that evaluation is going to be done, if there is going to be camera technology in the vehicles, you know, how can we conclude that --

MS. HARTMAN: Cars were actually stopping, yes.

MEMBER SHAHEEN: Right, that this an effective technique.

MS. HARTMAN: Right. So exactly the types of conversations we are having. For what it's worth, we've got the bulk of the team that was part of the safety pilot model deployment evaluation as our safety evaluators.

So they are bringing the wealth of knowledge that they gained from that into what they are doing here. We do not right now, I am trying to remember how many cameras we -- I don't think we even have cameras installed. I'm looking at Deepak and Jonathan --

PARTICIPANT: No.

MS. HARTMAN: Yes, I'm not, to the best of my knowledge, aware of cameras that we're putting into the vehicles to get driver behavior, and there has been a lot of discussion about sharing of the data and how it gets shared and so we are really, there are a lot of people focused working on this and I am happy to, you know, get into a technical conversation with you about this and what

we are doing.

I am hoping that -- I realize as I am talking the next presentation needs to go deeper into the evaluation because --

MEMBER SHAHEEN: Yes, just, you know, I am an evaluator --

MS. HARTMAN: Yes.

MEMBER SHAHEEN: -- and have been for over two decades and I think one of the things that is really important here given the context of the conversation that I am hearing is I think that causality is going to be really important.

And often times I find in evaluations the causality element is overlooked and we can't necessarily infer causality --

MS. HARTMAN: Yes.

MEMBER SHAHEEN: -- through stated response, right, in a survey document, so, you know, surely look at a survey, right, but I think some kind of objective data would be very helpful to calibrate the validity of that.

MS. HARTMAN: So let me ask you --

MEMBER SHAHEEN: Yes?

MS. HARTMAN: -- just eye level, if it's not a camera what else would it be?

MEMBER SHAHEEN: It could be data from the

braking of the vehicle --

MS. HARTMAN: Okay, so the data off the vehicle to and to get, you know, the timing of the --

(Simultaneous speaking.)

MEMBER SHAHEEN: Time, for instance, of the --

(Simultaneous speaking.)

MS. HARTMAN: So we are pushing --

MEMBER SHAHEEN: Because the surveys are going to come after the fact, right --

MS. HARTMAN: Yes.

MEMBER SHAHEEN: -- we can't remember.

MS. HARTMAN: Right. So we are pushing to get as much of the vehicle data as we possibly can, and that's where we --

MEMBER SHAHEEN: When you talk about the message, that's what I'd want to do is the align the --

CHAIR WILKERSON: Yes, analytics of those.

MEMBER SHAHEEN: Yes.

MS. HARTMAN: Right.

PARTICIPANT: Right.

MS. HARTMAN: And so what we are getting is the negotiation with the sites and the protection of privacy and all of the institutional, you know, not wanting to share things because I don't know what the Government is going to do with it type activity.

So we are deep in the middle of trying to tease that out, but I will take this back to the evaluation team and have a very detailed conversation with them.

MR. LEONARD: But it isn't exactly that basic safety message, the BSM data that we gathered in Ann Arbor that you are also trying to gather through the pilot sets that would tell you the DSRC unit received an alert --

MS. HARTMAN: Yes.

MR. LEONARD: -- the vehicle started to brake --

MEMBER SHAHEEN: Braked.

MS. HARTMAN: Right.

MR. LEONARD: -- and then either there wasn't a collision or there was a collision at five miles an hour and you would see that --

MS. HARTMAN: And, again, you know, we've got the bulk of the team --

MR. LEONARD: -- maybe there was a collision at five miles an hour instead of one of 20 miles an hour.

MEMBER SHAHEEN: Exactly.

(Simultaneous speaking.)

MS. HARTMAN: We've got the bulk of the team that did the safety pilot model of that and model deployment evaluation, so there is nobody better in terms of folks that we can get to bringing their knowledge in

here.

MEMBER SHAHEEN: Yes.

MS. HARTMAN: But I will definitely take this back and, you know --

MEMBER SHAHEEN: Well, thank you.

MEMBER DENARO: Yes. One of the big challenges for the connected vehicles, of course, is the time it takes to deploy their systems if it's an OEM solution only. And I know you have been looking into after-market solutions and so forth, what's the status of that?

MS. HARTMAN: The pilots are all aftermarket.

MEMBER DENARO: Okay, but do we think that that is going to be something that will be deployed and available for consumer vehicles then?

MS. HARTMAN: We have -- I mean there are vendors that are coming to the table. Tampa partnered with Brandmotion. New York has, they are in the midst of, I don't think --

MEMBER DENARO: Well --

MS. HARTMAN: They are in the midst of their contractual procurement so I don't know who they have picked, but they have been basically trying to seed the market to get people to bring technology in.

Wyoming is partnering -- Can I?

PARTICIPANT: Yes.

MS. HARTMAN: Lear, with Lear, so there is a market being developed here for these devices and I can't believe that those vendors would be showing up to participate if they didn't have an end game in mind.

PARTICIPANT: Yes.

MS. HARTMAN: So I think there is something there, I am pretty sure the vendors think there is something there, what their business plans are --

MEMBER BERG: It's a really different market though for aftermarket.

PARTICIPANT: Yes.

MEMBER BERG: I mean people are looking -- if you are talking about retail aftermarket, like accessories and --

PARTICIPANT: Buying it at the --

(Simultaneous speaking.)

MEMBER DENARO: Well, that's what I was telling you, limit it to distribution solution.

MEMBER BERG: So those guys need margins that are --

PARTICIPANT: Really big.

MEMBER BERG: -- big, big, big as opposed to OEM.

PARTICIPANT: Big time, which --

MEMBER QUIGLEY: There is an app called Nexar,

it's based, developed in Israel that we are testing out rates right now that just collects all the data that you were just talking about that app Nexar.

MS. HARTMAN: Yes. To be clear, the pilots, we absolutely, you know, if they open solicitation with available foreign OEMs that come and partner, so --

CHAIR WILKERSON: So that was my question, was given the time frame of this process will there be an ongoing solicitation as new technology comes out or are you soliciting people, are you presenting your pilots hoping that other people will come into the pilot along the way to solve some of those problems or -- I worry that you will be 18 more months or 38 more months down and then there is a new app or a new --

MS. HARTMAN: I can tell you right now we are bringing in --

CHAIR WILKERSON: Okay, so there is a --

MS. HARTMAN: -- people as they see what we are doing. Actually, one of the bigger one's -- Deepak's back there shaking his head yes, so I know I'm on the right track.

CHAIR WILKERSON: Oh, no, that's good.

MS. HARTMAN: But the one that comes to mind, and it's not a commercial, but it's the traffic signal.

CHAIR WILKERSON: The NTSB.

MS. HARTMAN: Yes, that is the folks who were developing some of the traffic signal integration and coming to Tampa as a cost match. We are not paying for it, it's coming in.

So, yes, we are getting attention. Again, I think we'd get more attention if we start doing a bit more outreach and marketing, so --

CHAIR WILKERSON: Yes. I think that will be key, also it will attract a recognition.

PARTICIPANT: Say that again? I didn't --

CHAIR WILKERSON: No, I said I think it will also, like it goes to your question as well, too.

PARTICIPANT: Yes.

MS. HARTMAN: You got to start somewhere, right?

PARTICIPANT: Yes.

MS. HARTMAN: You've got to start somewhere, so -- You know, and we do have the ATCMTD grants that have an ITS component, so if somebody is looking to do something there, you know, they can apply. I can't say we can --

(Simultaneous speaking.)

MEMBER QUIGLEY: When will that latest round be announced, do you know?

MR. LEONARD: Who's the applicant?

MS. HARTMAN: The ATCMTD?

(Simultaneous speaking.)

MS. HARTMAN: Yes.

MR. LEONARD: Advanced Traffic Congestion Mitigation --

MS. HARTMAN: Something Deployment.

(Simultaneous speaking.)

MR. LEONARD: Well, I always refer to it as the Section 604 --

(Simultaneous speaking.)

PARTICIPANT: Oh, yes, that one, got you.

MS. HARTMAN: That one, yes. You don't want to know what --

MR. LEONARD: But we are in the midst of evaluation right now. It will be announced --

MS. HARTMAN: Has to by the end of the year, fiscal year.

MR. LEONARD: We will make a decision for the end of the year.

MS. HARTMAN: Fiscal year.

MR. LEONARD: It's a little harder for me to say when it will be announced because --

(Simultaneous speaking.)

MS. HARTMAN: So September 30th --

CHAIR WILKERSON: I'm sorry, could you repeat that again?

MEMBER QUIGLEY: It's all those acronyms, it's the Congested -- Say it again, the --

(Simultaneous speaking.)

MS. HARTMAN: Oh, okay.

MR. LEONARD: ATCMTD.

MEMBER QUIGLEY: ATCMTD, yes.

PARTICIPANT: And you are saying that's not going to be awarded or --

MR. LEONARD: No, I'm saying we are in the midst of the evaluation and so --

(Simultaneous speaking.)

MR. LEONARD: We go through a process, we make a decision, and it has to get briefed through the Agency and then there has to be a decision when that is going to be announced and there is legislative -- So the question isn't when is it going to be announced --

MEMBER QUIGLEY: Well some of us are, you know, like, yes, yes, we know nothing, we're --

CHAIR WILKERSON: I know nothing more to tell you.

PARTICIPANT: We've got jobs on the line now.

MR. LEONARD: But I think I said this in my opening remarks, we are on track. I have every confidence that we will award another 60, nearly $60 million this year.

MS. HARTMAN: Right.

MR. LEONARD: There is a provision that allows us to set aside a $2 million takedown for that and, in particular, we are interested in using some of that for evaluation because at a certain point, you know, over a 5-year period --

MS. HARTMAN: That's good.

MR. LEONARD: -- where we award five to ten of these every year, we will have 30 or 40 ongoing projects and I want to make sure that we are not just sending money out and doing all the projects, but also doing the evaluation of the effectiveness of the process and of the outcomes.

MS. HARTMAN: That's great.

MR. LEONARD: And because of the lag times with infrastructure projects like that it's important that we take that evaluation resource and prepare for it now --

MS. HARTMAN: Yes.

MR. LEONARD: -- maybe even do a little baselining, but for implementation. So we are having those discussion as well.

MEMBER QUIGLEY: Thank you.

MEMBER KISSINGER: If Ken was asking the question should this Committee get engaged more on that issue of regulatory versus non-regulatory I would say the

answer is absolutely yes.

PARTICIPANT: Yes.

MR. LEONARD: Yes.

CHAIR WILKERSON: You go ahead.

PARTICIPANT: Go ahead, you go right ahead.

CHAIR WILKERSON: What about the objectives --

(Simultaneous speaking.)

CHAIR WILKERSON: Put that chart back up, will you? Are you guys talking about his question?

PARTICIPANT: Yes.

CHAIR WILKERSON: The initial question? I was trying to write it down and I wrote "Advise the Secretary of Environment how do we change the collision avoidance using ITS technology. CV is not the only way to get to connectivity, how do we deploy new State resource to address collision and rural deaths."

So I wasn't sure about the regulatory link to that, but --

MEMBER BERG: Any idea between commercialization and regulatory? I'm not sure what we would do. That would be decided by the market and no matter what we do other than put a regulatory, or we advise rather than propose it with a regulation like we have been saying for the last five years.

I am not sure what we can do on a commercial

market to incite the car makers or the after-market people to pull records and record any of this.

CHAIR WILKERSON: However, there are regulations that hinder the ability of innovators to come in if they are not part of NOVM or -- I think there are FMVSS rules and other things, so, you know, other agencies have the innovators, you know, these platforms where they can do spectrums to innovate where you are kind of free to do so.

So I think where we see burdens that hinder the ability to get to the market faster, or for the aftermarket to develop, there may be -- I don't know, I'm just speaking off the --

MEMBER BERG: Yes, it's not a regulatory burden, I don't think, Sheryl, I think it's a commercial burden.

CHAIR WILKERSON: Okay.

MEMBER BERG: It's just power to buyers, I think. Maybe Ken has a different --

MEMBER MCCORMICK: Well, I think you're absolutely -- I mean part of the value of all of this is helping to, people are going to be able to articulate the vetting proposition for why we want to have it.

GM when they built their OnStar light and tried to sell it through Best Buy, you know, it failed dismally

because they really couldn't explain to you why you'd want to spend money to get, you know, this capability in a car that wasn't GM.

And I think this will help because you'll be able to get quantifiable information of what does it really do, how many lives has it saved, how many accidents does it prevent.

MS. HARTMAN: Right.

MEMBER MCCORMICK: We have a lot of theory on what we think it's going to do and we have the safety pilot to remember what kind of information we could collect.

This is going to collect in real traffic in real places those activities that it is specifically looking to solve, right, and we'll know which ones it does catch and solve and if the nutrition rate for the ones it does --

MS. HARTMAN: I have to say, and I can't stress enough working to resolve the technical is fairly small but it's still challenging, but the interoperability issues and the fact that you can, you know, we keep kind of joking, but taking a truck from Wyoming and driving it through New York and Tampa to make sure everything works.

And there is going to be something along those lines and we're still trying to tease out exactly what --

MR. LEONARD: We're not joking.

(Simultaneous speaking.)

MS. HARTMAN: But, you know, that stuff is something that an individual company couldn't -- Well, I guess they could, but not on, you know, in their own world. So we think that we've got some value there in terms of providing some of that information that will help to make those kinds of decisions.

MEMBER KISSINGER: Well, my sense is the, I mean --

CHAIR WILKERSON: Egan was next.

MEMBER KISSINGER: -- most of the OEMs need to do that thing-- we need a reg in order to --

(Simultaneous speaking.)

MEMBER KISSINGER: -- in order to justify us really getting into this market, and now it seems like, and I think my sense was the Department was, to the extent they ever are, were committed to a regulatory approach, and now I've sort of, you know, I am not wedded to, I mean I am not wedded that we need a regulation per se, but it seems, you know, just today I mean it seems like you have opened up a discussion about should we spending more time looking at non-regulatory solutions to this problem and if we are I think that is the purview of this Committee and I don't think it's going to be just by the market.

I mean you've got other issues. I mean think of the cost associated with the infrastructure, you know,

V2I, and we can't even fix potholes and we're talking about, you know, the need to build the infrastructure to make these systems work would be normal.

PARTICIPANT: Well, I think that --

(Simultaneous speaking.)

CHAIR WILKERSON: Egan was next. Egan was next.

PARTICIPANT: Oh, sorry. No, I was just going to respond to the questions because I think it comes back to Debra's point again.

It's that outreach, that information to those folks to get involved. I have actually been to the aftermarket, their conferences, to speak on, you know, what's been on going on, the CV pilots, and that's, it's really what interested folks because a lot of the time they aren't even aware of this opportunity, so it is presented to them as an opportunity but also presented to them as an opportunity to do something that it is possible from these sort of demonstrations that you can sway the needle direct, the decisions that they make, so that they know, hey, maybe instead of just paying to fix all of these potholes we should start investing in some of this intelligent infrastructure elements and we won't have to pay to add additional methods or ways.

So we can get back some of the funding from

that through the federal program dollars and free up some of the funding that they normally spend on the infrastructure to what's looking for these technology solutions.

But it's a hard sell, but I think we've got to start going down that path and identifying these unusual suspects to start bringing them up to speed so that it generates a broader conversation, because you've seen this conversation happening a lot of places now, the consumer electronics, South by Southwest.

There's all this talk about automation but when folks discuss automation they sort of infer that connectivity is dead. You know, they talk about automated vehicles driving on the streets and you just sort of let loose of the vehicle, but the vehicle itself that they describe is connected to the infrastructure but without saying that that connectivity is there.

So there is a need for connectivity, everyone realizes it, but we need to help guide that discussion and provide some more technical solutions, some stewardship on what folks need to do. I think that's --

MEMBER KISSINGER: If I were in Ken's shoes, at the end of this pilot people are going to think like, people are going to ask me do we have enough information right now to justify a regulation, or do we not need a

regulation because we can generate enough private sector and let the market handle this thing.

And if not then what should we be doing between now and the end of this pilot to make sure that we can answer those questions, because if we don't consider it until we're, whatever it is, the end of the pilot, how many months away from --

CHAIR WILKERSON: Thirty-eight months, 18 more months?

(Simultaneous speaking.)

PARTICIPANT: Thirty-eight.

CHAIR WILKERSON: Thirty-eight.

MS. HARTMAN: Thirty-eight. Less than twenty.

MEMBER KISSINGER: Yes, that's a long time.

MS. HARTMAN: We're hoping to get information out sooner, but --

CHAIR WILKERSON: Bob?

MEMBER DENARO: Well, okay, on the New York pilot you emphasize the mobility or communication for multiple devices, is that over cellular or are those special DSRC-equipped devices as well?

MS. HARTMAN: I believe they are cellular --

PARTICIPANT: I'm sorry, your question is in reference to?

MS. HARTMAN: -- because it's on --

MEMBER DENARO: The mobile devices in New York are those being communicated over cellular or are dual, through the radio --

MS. HARTMAN: I mean, well, it's two because --

(Simultaneous speaking.)

MR. WALKER: So they are actually mainly DSRC.

MEMBER DENARO: They would be, okay.

MS. HARTMAN: I thought they went down from the vehicles to the DSRC.

MR. WALKER: So the vehicles have DSRC technology, obviously, and then the mobile devices they are going to be using DSRC --

(Simultaneous speaking.)

PARTICIPANT: Could you please state your name for the record?

MR. WALKER: Jonathan Walker.

MS. HARTMAN: Sorry, yes.

CHAIR WILKERSON: Thank you.

MEMBER BERG: Well, I know that even in standard equipment vehicles you have a hard time locating themselves in the urban canyons of Manhattan and that seems to even be worse.

MS. HARTMAN: So --

MEMBER BERG: Last week I was walking down

through San Francisco trying to figure out where I was to try and find a restaurant and I can't even do it on a map, much less, you know, my trajectory to where I am walking to is hard.

So I think you are struggling, you are going to struggle with that.

MR. WALKER: So New York City did two pilot demonstrations with various vendors and one of the requirements was that they had to drive in lower Manhattan, you guys have been to New York City, and they actually had to record and also retrieve the GPS data.

And so they did that back in August and then they just did it a couple of months ago. And so the vendors are required to get a certain level of accuracy before they could even be considered.

MEMBER BERG: I get that for the car, but now I am talking about affordable phone users. Sometimes it will be in my pocket, sometimes in briefcase, sometimes in my purse, sometimes, I don't know --

MR. WALKER: Cellular.

MS. HARTMAN: Yes.

MEMBER BERG: -- how are we going to get the accuracy of that trajectory to avoid a collision --

(Simultaneous speaking.)

MEMBER MCCORMICK: Well, and I think that's a

really important thing that most people don't recognize.

I mean you can use this device whether it's in your pocket or in your purse or in your briefcase or on the seat of your car, and it has a really good accelerometer in it and it can be determined to an app and be developed to be general to your location, you know, there's a pothole, and over a period of time you can figure out how fast it's deteriorating, how many more are there, you can triage your maintenance to do them.

We recommended that program for New Jersey DOT in 2008 I think and they went and did that. So we need to talk about the infrastructure needs. We don't want to be too myopic about DSRC and say it's the end all for all things.

It does one thing very well for what it is designed to do, very securely, very quickly. There isn't a DOT on the planet that needs real-time information.

I tell Kirk Steudle there is a pothole right here, right now, he is not sending somebody out to fix it right away. It might get done that week, right.

So when you really look at it is that when you talk about V2I there is actually no real reason not to use cellular for the latency aspects that you need because it's not doing active safety.

V2I doesn't do active safety, only V2V does

active safety, at what point is one not just reactive but preventing.

MR. LEONARD: I am not sure that I would agree that V2I doesn't, can't provide active safety and some of the things --

(Simultaneous speaking.)

MS. HARTMAN: There are V2I applications that don't need DSRC to work.

MR. MCCORMICK: Right, but I'm talking about the nature of cellular not the ones that are DSRC.

MR. SCHROMSKY: Most of -- Yes, I would tell you it is real-time. Most of your traffic cams, your red light cams, your DOT cams, all connect via satellite.

You need a primary or backups everywhere where it is more urban, whatever it may be. And, Bob, you notice in GPS --

PARTICIPANT: Right.

MR. SCHROMSKY: -- that it helps you're going to pick up three wave points. You're going to pick up the Wi-Fi signal, you're going to pick up, actually four, the accelerometer, you're going to pick the GPS, and you're actually picked up on the side of the actual GPS.

But I will tell you with the industry we are doing what everybody else is doing, the small cell technology is rapidly deployed as we speak, so Lower

Manhattan, yes, it may be a bowl in terms of GPS.

I will tell you all of the major carriers are actively pushing small cells on every light pole, every lamppost --

MS. HARTMAN: Right.

MR. SCHROMSKY: The challenge is going to be, and Steve talked about it before, in rural areas and staying there.

MS. HARTMAN: So we're going to learn a lot from these --

(Simultaneous speaking.)

MR. SCHROMSKY: I mean because I'm going to tell you one of the things people don't realize, elevation is still a challenge. That is, you know, so when you get into parking structures, whatever it may be --

MS. HARTMAN: We found that out.

MR. SCHROMSKY: Elevation is still -- That's a problem that we do not --

MS. HARTMAN: Yes.

MR. SCHROMSKY: -- you know, you're dealing with, you know, this happens today, especially in rural and urban areas, if you call 911, because a lot of people don't have a home phone anymore, cellular is a primary, right.

So I don't -- If PSAV is not registered and a

911 dispatcher, you know, we're in this hotel, case in point, how are they going to know what room are you in in this hotel.

There is no way 911 would actually know where you are right now. They would look, by the time they have to find the hotel register and find out where you are registered, whatever it may be, there would be no assignment to.

MS. HARTMAN: Yes, but I think one of the --

MR. SCHROMSKY: These are some of the challenges --

MS. HARTMAN: One of the things, just kind of a little side note, the elevation issue was discovered --

(Simultaneous speaking.)

MS. HARTMAN: -- and we have fed into the standards-making bodies what we have discovered.

PARTICIPANT: That's great.

MS. HARTMAN: So that's outreach to a usual suspect.

PARTICIPANT: That's great.

MS. HARTMAN: So, you know --

MS. GOLD: And, Kate --

MS. HARTMAN: Yes?

MS. GOLD: -- just to say one thing here, in addition to the kind of publication-type process one of

the things we are doing in the collaboration is to continue real-time collaboration at a technical level and there is a lot of people that are participating in these projects who have representation in the ecosystem who are pushing things out quickly.

So if we identify that there is a deficiency in the standard or something that needs specification, you know, something to be updated, it's happening in near real-time, having to consider some other sites and then pushing it out.

And then the other thing, just to pull together with where you are saying the evaluation, we are identifying still areas that need more focus, like time and location accuracy and performance.

That's one of the things that came out recently is, hey, you know what, it's not just enough to have like a bullet point on a lessons learned list, we have to add this to the list of evaluated pieces for the independent evaluation and really have a plan for baseline data and evaluation right.

So if there is other things that you are looking for at that level it's a good background.

CHAIR WILKERSON: Bob, I think -- No.

MR. ALBERT: Steve, please.

CHAIR WILKERSON: Yes, Steve was next.

MR. ALBERT: Before I became this rural crusader --

(Laughter)

(Simultaneous speaking.)

MR. ALBERT: -- I used to manage the Houston ITS and Transportation System for many years and one of things that we always had a problem with is the HOV lanes are very good separated and reversible and we would get idiots on there going the wrong way.

And when I see that some of the demonstration is about changing driver behavior, telling someone they're going the wrong way, good luck, because most of the time they are drunk, right, and you are not going to change people's behavior in the middle of them being drunk.

And so driver behavior is such a key thing, but I thought it was a little overreaching in the wrong way.

MS. HARTMAN: They identified it as a serious problem in Tampa, had statistics to back it up, and had an approach to try and solve it, so --

MR. ALBERT: Okay.

MR. LEONARD: And some of it may also have to do in Tampa --

MEMBER SHAHEEN: Age.

MR. LEONARD: -- with an aging population.

MEMBER SHAHEEN: Yes, aging population,

dementia.

(Simultaneous speaking.)

MR. LEONARD: You know, again, it doesn't diminish your point that you may not be able to --

MEMBER SHAHEEN: Yes.

MR. LEONARD: -- and if it is less --

PARTICIPANT: Right.

MR. LEONARD: -- and may not be able to address it, but you can warn the others who are heading in --

(Simultaneous speaking.)

PARTICIPANT: Heading in there.

MEMBER SHAHEEN: Yes.

MR. LEONARD: And there is an old joke I will tell you when we are not on transcript about --

(Laughter)

(Simultaneous speaking.)

MR. LEONARD: The joke is the guy calls his wife, gets a phone call from his wife that says be careful there is a wrong way driver on the highway, he says there's not one, there's hundreds of them.

CHAIR WILKERSON: All right. So if we are -- I am just doing a time check here, five minutes over into our break, and, Kate, how long will you be here?

MS. HARTMAN: I can be here as long as you need me. My boss is standing right there, so --

CHAIR WILKERSON: Okay. So, I don't know, Bob, you can have the last word.

MEMBER DENARO: Thank you. Okay, I want to make somewhat of a strong statement. My question about LTE, about cellular and the phone and so forth, I believe the Department is making a big mistake in not embracing cellular more strongly.

There is a lot of attacks, increasing attacks, on DSRC because supposedly LTE or maybe 5G device-to-device technology can do that.

There actually have been demonstrations of effective vehicle-to-vehicle communication for safety purposes over cellular, and not something that is deployed yet, but that possibility.

However, I believe, and I think we believe that DSRC has a role, an important role, in spite of some of that work. I believe it would be wise for the Department in some of these tests to embrace LTE cellular where it can be used, such as for vehicle infrastructure and so forth, and that combination.

And that requires, I mean I looked at your list of use cases and so forth, some of those I believe are moot at this point with DSRC. I think they can be solved by sensors on vehicles, I think some of them can be solved by cellular application and so forth.

So I think we need to re-look at the use cases for DSRC and, sure, we're focused on the ones that truly benefit and can only benefit from DSRC and embrace LTE where it can be used.

I know that the original architecture when we saw this three or four years ago said that the transport there was replaceable. So the fundamental system design allowed for the various kinds of communication devices and channels to be used.

I don't see us exercising that and showing that and I think our position with the broader community would be better if we embraced a combination of those communication techniques.

MEMBER MCCORMICK: And that's exactly what they are doing in China. In China they use both LTE, LTA, 4G, and the 5G implementation that they have just put in last year --

(Simultaneous speaking.)

CHAIR WILKERSON: All right.

MEMBER DENARO: And that could be the source of this dark threat. If there is substantial demonstrations of capability in other countries, in other regions, and so forth, that pressure is going to come back to us.

So I believe we need a more mixed approach to this.

CHAIR WILKERSON: Okay. Well, we will continue our discussions with Kate while she is here and we'll take a 15-minute break.

(Whereupon, the above-entitled matter went off the record at 10:07 a.m. and resumed at 10:27 a.m.)

CHAIR WILKERSON: So first of all, thanks so much, that was really great. I thought that was really great discussion --

(Simultaneous speaking.)

CHAIR WILKERSON: -- very worthwhile and thanks for recommending the --

PARTICIPANT: Yes, I appreciate that. It gives us some great knowledge of stuff that's going on.

PARTICIPANT: Yes, it was great.

MEMBER SHAHEEN: I didn't know a lot about those pilots, so that's --

PARTICIPANT: Yes, I agree.

(Simultaneous speaking.)

CHAIR WILKERSON: Kate, I don't know if you heard that, we --

(Simultaneous speaking.)

CHAIR WILKERSON: I was just commenting and saying thank you to the folks who recommended that you give that presentation and some of the Committee members were saying how, I'll let you speak for yourself --

MEMBER JOHNSON: And, also, it was awesome because basically we have this mission here and so basically this helps us determine where we want to go with recommendations or what we want to opine on because we could do something for not and you guys have already done it or you looked at it, so this makes our efforts a lot more fruitful.

MS. HARTMAN: Great. I welcome your input. I absolutely look forward to what you have, you know, the advice and guidance that you have.

Again, my focus has been getting all the technical stuff, working enough, and I am all ears, so, thank you.

CHAIR WILKERSON: Before we begin with Bob Sheehan we have, I think there may be a few folks in the audience who did not introduce, who just came or joined us during Kate's presentation.

If you joined us during her presentation could you please stand up and introduce yourself. And then, also, there is a sign-in sheet, we are requested to have you sign your name and contact information for the record.

MS. MCGIRK: Hi. I am Kathryn McGirk. I am with the consulting firm McAllister & Quinn. I am here on behalf of the Catholic University, CUA.

CHAIR WILKERSON: Oh, in my neck of the woods.

Great. Anyone else?

MR. WALKER: I am Jonathan Walker. I work for the ITS JPO and the USDOT and I am in charge of the New York City autonomous vehicle project.

CHAIR WILKERSON: Great. Anyone else?

(No response.)

CHAIR WILKERSON: Okay, I think we're -- Great. So, thank you so much, and please do sign the list for us. Bob, you have the floor.

MR. SHEEHAN: All right, thanks. So good morning, everybody. My name is Bob Sheehan. I am with the ITS Joint Program Office and like everyone else in my office we manage multi-modal and multi-disciplinary projects.

So what I am going to review today are some key efforts that we have been kind of adding the ingredients for a few years now and simmering these projects and -- various projects we've moved forward.

What we are going to go over is the Mobility on Demand effort and its projects within the Federal Highway, FTA, and JPO, and then focus on our ATTRI program with the fundamentals of accessibility and technology to support accessibility.

So starting out with Mobility on Demand, so fundamentally what we are doing here is recognizing the

changes in demand and supply in the transportation system and to put together an integrated and connected multi-modal network of safe, reliable multi-modal transportation and options.

Fundamentally we are seeing a convergence of different things together. They have focused in the past on demand management. We have the ongoing shared economy applying itself to the transportation system.

We still have a need and a focus on TSM&O and, of course, we have the connecting vehicle, which turns into V2X, and focusing on connected traveler, and so how do we bring these things together.

We can leverage things from the past that focus on, or allow us now to better focus on applying economic principles to the transportation system.

We've had examples of pricing from the past, dabbled in incentives, but now we see it happening more often, bringing travelers together.

We just had a great conference last week for folks who were here in California last week focusing on automated vehicles. There was a heavy focus on shared automated vehicles, conversations with Lyft continue, whether through that meeting or we are having conversations on some of the work of the Mobility on Demand sandbox, and I'll get into that in a minute.

So the trends that are driving this program, we have social trends. Over the next 30 years the U.S. population is going to grow, it's going to shift, whether people are going to shift where they live, people are getting older, people want to age in place, they want to retire in place.

Transportation is focusing more on data, and I am personally going to talk about that later on this afternoon. More people own a smart phone and every day that number, that percentage, increases.

It's not the just the ownership increases, but the utilization of those phones increases. The apps continue to increase, the data integration from private partners continue to make these devices better and provide better service for travelers, and, of course, automated transportation is offering additional possibilities.

And mobility trends, we're spending hours and hours and stuck in traffic every day, and this is not just in the city environment, we're seeing and looking at the approach across the urban landscape.

And so, but I highlighted before and I think it's a big part of this is the growing share, or growing popularity of shared mobility services.

And this is not to confuse shared mobility with Uber and Lyft solely. There are other things that really

come into this world, demand response service, you've heard of mobility as a service in Europe, it's a European model and we want to see how it works in the U.S., and so that's some of the, you know, one of the things we want to focus on.

The auto sector is stepping into the market. We see examples of the auto sector, Ford, let's see, bought a commuter service “Chariot,” is buying or bought “Car-to-Go.” And, Susan, you probably can rattle off a list of partnerships and acquisitions over the last few years.

GM invested in Lyft, Uber has partnered with others, and so this is happening more often and continuously. So the shifting landscapes, so State and Local DOTs are leveraging transportation network companies, taxis and volunteer drivers to address the gaps.

And so fundamentally new technologies and solutions are changing the way customers plan and take trips and so we want to help understand that and see how ITS supports and helps evolve these models further.

So our guiding principles, one of the key guiding principles that started the discussion with FTA about three years ago sitting in a room with, focusing on past projects, mobility services for all Americans, our past integrated management program.

So, okay, what's next? So we recognize we want

to look at a traveler-centric point of view, and it's based on connected travelers and data.

We want to look at a mode-agnostic platform and fundamentally we are seeing a way that we are redefining public transit, public transportation, and this is something FTA has really embraced.

They said we're not looking at public transit anymore, we're looking at a different modal of mobility concepts, and so that's the key, it's looking at it a little bit differently.

So it provides a, transit will provide the backbone for a multi-modal integrated transportation system. It's not going to be eliminated, but it needs to be there and supported and complements with all the other solutions.

And things may change. The systems, as with the, and we'll talk about the Mobility on Demand sandbox next, the sandbox allow us, you know, FTA has invested heavily into the project to test out different business processes or policies and new technologies and operations.

So the key challenges cover a number of things, and I know the presentation will be made available, but we're documenting these things in various projects, including some foundational research to document the equity, accessibility, social operational impacts,

technical impacts, economic impacts, of a different approach than mobility within the mobile and van program.

So you want to look at bridging first and last MOD solutions. What's interesting though, is if we focus on first and last MOD we also recognize the complete trip.

So other offices are probably looking at what would be the ideal performance measure for the system and they are looking at a system from activity measure that recognizes the complete trip, from as soon as you leave your door to as soon as you arrive to your office and each part in between.

So this really carries over to the accessibility project because you have to go through the door. Stepping in here to get to this room, once I enter the building that was it. Trying to find like a map, but it didn't really clearly say 14th floor.

But from anyone that requires an accessible service, if I had a sight impairment or a hearing impairment or a mobility impairment, it would have been tough to get to this room, all right, and that's just the general navigation.

So what we are looking at is baseline a universal design for everything. So we really want to see how we can apply principles and, you know, advance these innovative business models and looking at different policy

and legislation among many challenges.

So our current MOD activities, we're doing foundational research, and this research is led by the Booz Allen Hamilton team, primarily led by Dr. Shaheen leading our understanding of what the operational approach concept is and then what are the key challenges and enablers are.

We have identified performance metrics with the Transit Center in New York City and that supports the MOD sandbox. The Innovation and Knowledge Accelerator, that's just a general approach to provide tech transfer at every step of the process.

What did we learn, what can share, the performance metrics, a series of performance metrics covering social elements, all the way to technical issues and system performance as well as user or traveler-centric performance, built around the sandbox demonstration of the evaluations, doing a demonstration at 11 sites and doing comprehensive evaluation.

And this all gets into documenting policies and practices and putting it on the FTA site, JPO site, and the Federal Highway for Mobile Offices is also conducting work, whether that's the planning or doing work for MPOs, Office of Operations doing work to document and understand what share mobility is, document and share what smart phones and mobile devices will do for mobility.

So the last part, to understand user-centric we are trying to look at the system instead of from a traffic management center's perspective, shift and say from a travel perspective how it would look if it represented multiple mobility options and how would we utilize those in your everyday activities.

And so it goes from the public transit, you need integrative payments to support it, incentives are a key part, because we have to understand that's a big part and we recognize and see that economics can be a research error for multiple agencies, and that is a key part to understanding and using ITS to influence travelers, because fundamentally, and we have learned this from other projects, we can apply technology but next week's shift travelers will change their behavior, given different options, better information to make better choices to have the ability to actually fund, mentally control, or change the performance of the system.

The supply is different, the demand is different, and we have several enablers, including the emerging technology, the infrastructure. There is various ways to look at that.

We recognize, for example, curb space is a huge issue dealing with TMCs in an urban environment. Real-time data management, we work heavily with Ariel to

understand and right now at the sandbox it's a big issue of how to manage the data and not only manage the data but manage the data and the policy when you are dealing with these private parties.

You say wait a minute, this, you know, we're getting into their proprietary, we're getting into their business model, and we don't want to. We're not -- Our objective is not to take, I think, to take away from the business, but it's better mobility for all.

So, anyway, getting into the policy regulations and business models, and so what you see is a relationship between the private and the shared use and any trip in any particular day will be the combination of multiple elements, private, with shared, with private again, whether it's a work-based trip, non-work-based trip.

And another key effort is understanding that this is not just an urban issue. Now we are looking at it from the SIG Center out to the rural environment and TMCs are disrupting mobility along this entire continuum and it's an important thing to understand how it is being done.

Again, talking about performance metrics, and this is a key part, this is affecting the evaluation and of the sandbox. So the sandbox was an opportunity to explore Mobility on Demand models.

Seventy-eight sites, 11 were selected, so it

really represents I think a powerful statement that 78 applied and although it was only limited to 11 probably more could have been selected.

And what we are covering for the sandbox is a number of different things that focus on user focus mobility platforms, trip planners, integrated payment systems, first/last MOD solutions, subscription-based ride sharing, fair value commuting, demonstration with incentives, integrated carpool to transit access in the Bay area, innovative and public private partnerships to power transit, focusing on developing standards for trip planning and system data availability for real-time and shared use.

Most folks have heard of GTFS, General Transit and Fee Specifications, and looking at the data specifications for additional data from transit providers and from providers of shared use and how they can be incorporated into public agencies.

So we have different products to show, detailed what's available from each sandbox site, but 11 sites, and then fundamentally we are doing a conference of evaluation of these sites.

We have developed an overall evaluation framework set by guiding principles working our way down to the approach for each site.

And the key thing with the guiding principles along the top we're focused on system integration, the partnerships that are driving this, the business models that are also supporting these innovative approaches, and then the equity of service is a key part, equity and accessibility.

And so the team also lead by Booz Allen and Dr. Shaheen for this project, so right now we have developed, I believe, all of the framework -- I believe we've completed all the frameworks and now we are getting into the test plans and the idea is to have for the first year get it operational and then operate for about a year and collect the data.

So that's the fundamentals of Mobility on Demand Program. We have projects that are underway in several offices, on the Federal Highway side, we have multiple offices at Federal Highway, the Federal Transit Administration, multiple offices in Federal Transit, the ITS JPO, and even our research office out in Turner-Fairbank is looking at different approaches to analytics for a mobility on demand environment.

If there are no questions at all I will just jump right into ATTRI because it's a seamless thing, but --

MEMBER JOHNSON: I have a quick question. On

Slide 8 you referenced applying economic principles to mobility, what specifically do you mean relative to, you know, the economic principles?

MR. SHEEHAN: Okay, supply and demand --

MEMBER JOHNSON: Okay.

MR. SHEEHAN: -- and incentives for mobile balancing of the system.

MEMBER JOHNSON: And I asked the question because considering we are talking about accessibility and talking about transportation there is a large population that often can't afford transit options, right, because they don't have access to smart phones and apps and so forth?

MR. SHEEHAN: Yes.

MEMBER JOHNSON: And this is top of my mind, I just read an article yesterday, and perhaps you can speak to this, in Oakland they are leveraging ridesharing and people are talking about how it's not going into East Oakland which is a primarily African American/Latino community and they need jobs but basically it's everywhere else, it's been gentrified, and how are they supposed to get to jobs if they don't have access to mobility.

So keeping that all in mind I am wondering, you know, individuals that really need to access transit may not be able to have, you know, a SmarTrip card here or a

TAP card in L.A., or, you know, an Oyster card elsewhere, so I mean is that going to --

MR. SHEEHAN: You've drilled into a key issue of equity of service.

MEMBER JOHNSON: Yes.

MR. SHEEHAN: Fair payment --

MEMBER JOHNSON: Yes.

MR. SHEEHAN: -- access to areas that are underserved, whether historically or in some cases, and you probably have some articles, whether the TMCs are providing access to certain areas.

MEMBER JOHNSON: Exactly.

MR. SHEEHAN: If you are going to have relationships with a public agency that's an issue.

MEMBER JOHNSON: Yes.

MR. SHEEHAN: So you can correct me if I am wrong, but that's -- and that is something that has been identified as if you're going to do this then you have to provide the service.

MEMBER SHAHEEN: So it's a major barrier to I think this new age of IT-based mobility, right.

MEMBER JOHNSON: Yes, it is.

MEMBER SHAHEEN: It is we are potentially leaving behind the people who would benefit most from not having to rely on a car, right, but we're not getting --

(Simultaneous speaking.)

MEMBER JOHNSON: -- with L.A. Metro but I know we have had this conversation because my agency is part of the TAP system and --

MEMBER SHAHEEN: Yes.

MEMBER JOHNSON: -- and we are working with them in partnership that we are going to go down this road with them, but I just wanted to throw that out there --

MEMBER SHAHEEN: Yes, it's big.

MEMBER JOHNSON: It's something that plagues us continuously.

MEMBER SHAHEEN: Yes.

MEMBER JOHNSON: And I know we can't fix it here, but this is something that I am interested in as we march down this path to see what can be done.

MR. SHEEHAN: Well, we are working on a project now, just so you know, we have a project with L.A. through one of the sandboxes.

MEMBER JOHNSON: Right. No, I am aware of that very much so.

MR. SHEEHAN: Good. And so that is partnering with TMCs and also recognizing the TAP card --

MEMBER JOHNSON: Right.

MR. SHEEHAN: -- and Go L.A. and to your office as it is there as well and to bring in, you know, trying

to bring in those things. And, you know, also, L.A. led some approaches and incentives-based posts for opportunity.

MEMBER JOHNSON: Yes.

MR. SHEEHAN: And so that was a good opportunity.

MEMBER MCCORMICK: At a meeting with Mike Duggan, the Mayor of Detroit, back in June and because, you know, their primary issues are part jobs, health, and mobility. It didn't have anything to do with cost, right.

I mean that is all about getting these people, exactly to your point, to jobs, to where you need to go, and to have access to it, and they are putting together a multi-million dollar program that they are going to launch in the fall, how much information is available on the website on all of the things that have gone on that they could harvest, you know, useful ideas from?

MR. SHEEHAN: That's -- Wow, yes, we didn't follow up on that. So with our evaluation contractor part of the effort is to document as we go along, and so we are trying to document that into presentation form because the final report will be later, so we want to document those lessons learned. The --

MEMBER MCCORMICK: So it's not out there now?

MR. SHEEHAN: Right now, no, it's not out

there.

PARTICIPANT: No.

MR. SHEEHAN: But I believe the contractor can make this framework and the evaluation framework out there.

MEMBER MCCORMICK: Okay.

MR. SHEEHAN: By the fall we are just starting the operation or installation of these projects, so that's going to be a little bit limited.

The Federal Highway Office of Operations has two reports out already looking at shared mobility, a good term of about 30 or so pages or more, and also smart phones --

MEMBER SHAHEEN: Thirty?

MR. SHEEHAN: Maybe 50, 70?

MEMBER SHAHEEN: Over a hundred.

PARTICIPANT: Over a hundred, yes.

(Simultaneous speaking.)

MEMBER SHAHEEN: I wrote most of it, so I do kind of remember more than 30 pages.

MR. SHEEHAN: Yes. So ideally it's a lot of FAQs. And then the Office of Planning, I think their report should be out by the end of the year and then through the tech transfer we are converting other things into smaller bits of fact sheets and lessons learned as we go along, so that's the intent, but I can get a better read on what we

have available now and what we hope to have available by the fall.

MEMBER MCCORMICK: Okay.

MR. SHEEHAN: Steve?

MEMBER ALBERT: Bob, we've been doing quite a bit with Mobility on Demand, obviously, in rural areas --

MR. SHEEHAN: Yes.

PARTICIPANT: Yes.

MEMBER ALBERT: -- which are almost equal to probably the most urban plighted areas and that there is just nothing out there.

But we just finished up a study looking at millenniums and national parks and public lands and what they want in service, which is kind of mobility on demand.

MR. SHEEHAN: Yes.

MEMBER ALBERT: And we are inventorying for the United States what is going on in rural areas relating to mobility on demand, so we are trying to get some things off the ground where I live in Bozeman.

MR. SHEEHAN: Yes.

MEMBER ALBERT: So if I can get a card from you maybe then I can send you that --

MEMBER SHAHEEN: Can you share that information with the Committee?

MEMBER ALBERT: Yes, I'd be glad to.

MEMBER SHAHEEN: That would be great.

MR. SHEEHAN: Yes?

MEMBER ALBERT: Actually, I'll let you know that TTI just came out with --

MEMBER SHAHEEN: Well, we were just talking about rural areas. Sheryl had mentioned that, right?

MEMBER ALBERT: Yes.

MEMBER SHAHEEN: And you as well.

MEMBER ALBERT: And I know TTI did a report which was predominantly urban focused, but they didn't find much and --

MEMBER SHAHEEN: There is a lot going on in rural areas.

MEMBER ALBERT: Yes, that's what we are trying to do.

MEMBER SHAHEEN: Which I have been trying to elevate as part of the evaluation to FTA and to JPO, but there is --

(Simultaneous speaking.)

MEMBER SHAHEEN: -- I suspect there is a lot more.

(Simultaneous speaking.)

MEMBER ALBERT: -- the whole issue of who do you turn the car keys to when you are, you know, when your parents can't drive.

MEMBER SHAHEEN: Right.

MR. SHEEHAN: So you may have seen a report, you were at the conference in North Carolina this year and it wasn't -- it was another one, and met some folks from the public commerce. There was TTI working for the public commerce that hadn't seen any follow-up and there was concern if there had been any impacts of mobility from TMCs, but I haven't seen anything, and I have looked, and then --

MEMBER SHAHEEN: I am assuming.

MR. SHEEHAN: Yes, so their intent was to help understand the issue of taking action. Or, no, it wasn't, public commerce, it was the Department of Agriculture.

MEMBER SHAHEEN: Yes, you told me about that. So Bob, I just had a follow-up on one of the things that you said as part of your earlier remarks before we got into FTA --

MR. SHEEHAN: Yes?

MEMBER SHAHEEN: -- because I think it's relevant to this committee. But as part of the foundational work, one of the things that we spent a lot of time on was looking at the mass concept which has come out of Europe.

MR. SHEEHAN: Yes.

MEMBER SHAHEEN: And we took a really critical

eye towards what is mass from a European perspective, can such a model be transferrable to the U.S. market. And, you know, we concluded that it's a different government structure.

It's a different way of looking at these services and how to provide intermodality that may not transfer to a U.S. marketplace largely because of the types of companies that we have and the relationship between government structures and how we are laid out as a nation, okay.

But the other major observation that we made that was troubling to us was that there was a lack of focus on goods delivery.

So in the mass framework you'll see that there's all this focus on car sharing, the bike sharing, like all of that kind of goods stuff and then goods delivery is sort of out here in their visuals.

And we were talking more and more about, well, how do people actually get around these days. And what we're starting to see particularly among millennials and even younger populations, right, is that they're using Instacart, they're using AmazonFresh, they're using instant delivery.

I mean, at UC Berkeley we actually have an Amazon massive central location for people to just go do

pickup to reduce the amount of delivery trucks coming in to the campus because the appetite for Amazon goods delivery is so massive among the student population.

So one of the things that we did and if, Bob, you can go back to that visual that shows the supply and demand, is we proposed to FTA that, you know, maybe we use a different nomenclature like transportation as a service instead of MOD because we felt that how people are getting goods is also being "commodified," not just how people are traveling personally through mobility.

And so one of the things that's absent at present, I think in terms of the research agenda, is to look at goods delivery as part of MOD because what Bob's focused on in terms of those 11 deployments, is very much about people movement, not goods movement.

And I think we would argue that goods movement is destructing the trip chain just as much as a lack of a need to own an auto or have access to an auto because of a TMC.

MR. SHEEHAN: Yes.

MEMBER SCHROMSKY: I think another thing that occurred that's interesting, we're doing some studies and I did some of my own research, the unintended consequences.

MEMBER SHAHEEN: Yes.

MEMBER SCHROMSKY: Because the environmental

impact --

MEMBER SHAHEEN: Massive.

MEMBER SCHROMSKY: -- is totally being overlooked because I know from personal experience, I mean, Amazon uses the Postal Service a lot. Makes sense, right, because they're at that same mailbox every day that's along the route, right.

But when you get into other aspects of that delivery, I mean, myself in one day, two post office trucks came to my house, two FedEx, and one UPS.

MEMBER SHAHEEN: And it's not, that's not working --

MEMBER SCHROMSKY: It's not a sustainable model and, you know.

MEMBER SHAHEEN: It's not, it's not.

MR. SHEEHAN: And like so that the pickup point that you identify for Berkeley through an experiment here in D.C. with WMATA and Giant, Giant, the local grocery store and their Peapod delivery service where they have pickup points or sheds at two of the stops along the orange line. So the intent was get off the orange line, pick up your parcel.

MEMBER SHAHEEN: Yes.

MR. SHEEHAN: So you're reducing at least two legs of a non-workday trip out of the network. So the

trends of partnership are the biggest beneficiaries behind the agency. So I just, you know, it's something. It's an effort.

MEMBER SCHROMSKY: Yes. Because I mean all those vehicles unfortunately, none of them were electric, none of them, most of them are diesel, heavy, you know, it's --

MR. SHEEHAN: And that's interesting. There's a great example when you talk about this, as much as so we say, okay, it's your personal behavior is changing and I'm no longer going to Giant or Walmart or any other store. But how many trips, you just added three different deliveries and so --

MEMBER SHAHEEN: Are being generated.

MEMBER ALBERT: -- the network is actually increasing.

MEMBER SCHROMSKY: Yes. I mean, because that's, that's one of, when you look at this model the unintended consequences are the economic from the socioeconomic in terms of environmental impact, you're investing in real estate REITs in the retail industry. That's another hot topic right there because, you know, how many shopping malls are actually closing?

MEMBER SHAHEEN: And the stories on that are that we see it happening, yes.

MEMBER SCHROMSKY: Yes. One of the things that we're doing that we'll tell you in mobility I would say is, work play. We just kicked off in Irving, Texas, a massive project over a billion-dollar infrastructure project that we're doing that will actually bring offices, retail space, everything in one location so you can actually walk to it.

And the other thing we're doing in mobility, is we add lodging to structure we already have. We're actually turning a lot of our central offices in Lower Manhattan that we've mentioned, to shared work spaces.

So people actually register time out there, the fiber is there, the infrastructure's there, now the cloud services are hosted there.

So we're starting to see that. But we're starting to see it because one of the things we see in connectivity when you tell them to share, we see a lot of growth and we look at drones, right. Because that's the next thing you're talking service with.

It's, everybody goes automatically to Amazon. We're not, I mean, most of what you see is agriculture because the farming vehicle is actually autonomous. The drone is actually reeling that data and doing real time so a lot of the road inspection, bridge inspections, everything else, commercial use, everybody jumps on

Amazon's delivery but we see the market going into other areas, not in delivery being the first one.

So I mean that's, you talk about that in delivery because I looked at anything that, you know -- what scares me, that somebody's out walking to CVS, I start seeing words like obesity in public health coming to my mind as well.

MR. SHEEHAN: I picture WALL-E, maybe.

MEMBER SCHROMSKY: Yes. WALL-E.

MEMBER SHAHEEN: What did you say? WALL-E, maybe, yes. But I think what I just wanted to emphasize, right, is that the commodification of transportation is really disruptive, right.

And we're seeing this not just in the car sharing, the bike sharing, the ride sharing. The whole goods side of the commodification is perhaps much larger market-wise, economic-wise. Any impacts could be so much more significant.

But currently, at least in terms of the MOD Program, we're not evaluating or researching the goods commodification side, to my knowledge. And so that's really what I wanted to make sure that the committee was aware of in light of Bob's comments.

MR. SHEEHAN: No, that's a great point. That really has come out of that foundational research and it's,

we've taken, I think, a nice possible course of the slow approach because we, this isn't a, in a one year, in a half a year, things pop up and continue to change so how do you deal with that?

And so I think the sandbox with this being a really good way to get out there quickly to look at these different policies and models and as well as the foundation research instead of developing this, you know, concept and this is it, we're going to go, it's really moving parts.

And so I think representing as gears is kind of interesting because new gears are constantly being added for this to, you know, new comments, so.

MEMBER KISSINGER: In terms of evaluation, I'm just curious, in terms of the existing sandbox, I mean, we'll be evaluating and be able to look at like how close the performance metric like percent is successful in the whole community, travel times, cost, or?

MEMBER SHAHEEN: So overall, we do not have a plan overall but to more pilot specific impacts, definitely.

MR. SHEEHAN: So these are the general areas for performance metrics in the middle. It obviously --

MEMBER SHAHEEN: So change in travel time of that particular pilot?

MR. SHEEHAN: Yes.

MEMBER SHAHEEN: But, you know, full systemic effects of the entire transportation system stay in that community, no. We will not get it back.

MR. SHEEHAN: Or beyond.

MEMBER SHAHEEN: But we do have a control --

MEMBER KISSINGER: How do we know if that's good or bad because --

MEMBER SHAHEEN: Well, if you see down on the bottom, you'll see to the left side, you will have control treatments to get a sense of people that are not using the service. What, you know, how they're traveling.

And whether or not, you know, we're making contact with them and why not. Why are they not using these types of services?

But I think the goal is to evaluate it from an individual quality of life perspective, travel time savings, cost savings perspective. Those types of metrics will be captured.

CHAIR WILKERSON: Great discussion. That was really great.

PARTICIPANT: Thank you.

MR. SHEEHAN: And so all of this, to move forward --

MEMBER QUIGLEY: Sorry, on the one we're talking about, do you hear a lot of the argument that

Mobility on Demand will actually increase the number of vehicles and the number of trips as opposed to decrease it? I feel, I get that question a lot when I'm doing public presentations.

MEMBER SHAHEEN: Absolutely. And it will induce demand. Whenever you make it easier for people to travel --

MEMBER QUIGLEY: Right.

MEMBER SHAHEEN: -- just like when we build a highway --

MEMBER QUIGLEY: Yes?

MEMBER SHAHEEN: -- we induce demand. So I think one of the things that's really important is the feedback control mechanism that will allow us to start influencing the system and the dynamics through pricing or incentives or something like that, you know, and if we introduce automation connectivity in these types of mechanisms, any time we make it easier for people to travel or get access to more goods, guess what? We create more demand.

CHAIR WILKERSON: Which means you use the construction more officially, right. If it's more commercial maybe all the lanes are truck lanes, maybe they drop commercial lanes at 2:00 to 3:00 in the morning or something.

MEMBER SHAHEEN: Yes, yes.

MEMBER ALBERT: Well, that's a great point. That's the intent of related effort, is looking at more federal management and how do you optimize the system for various users.

MEMBER QUIGLEY: I think that could be really important because there's a municipality. I mean, our goal in all of this entire conversation is supposed to be about how we're going to make our existing infrastructure more efficient, how we're going to, yet not have to invest any more pavement because we're investing in other technologies and these advances so that's going to be a really big conversation.

Some of the, one of the things I always tell people is I think that once we have Mobility on Demand and you truly are paying for that trip, you're going to think twice before you hire that trip, because where I own a car I don't truly understand what the cost of the car is.

PARTICIPANT: Right.

MEMBER QUIGLEY: I have a garage, I have insurance, I have gas, I have all this stuff but I don't really understand the cost of that trip, of owning that vehicle. But Mobility on Demand of course we can really understand that trip to the golf course or the grocery store costs me five dollars. So I hope for that --

MEMBER SHAHEEN: That's the idea --

MEMBER QUIGLEY: That's how I always answer the question when people are --

MEMBER SHAHEEN: Yes, yes. That's the idea of it, right. But when we look at the, you know, the demand elasticity on private vehicle use, right, it's fairly inelastic unless you hit --

MEMBER QUIGLEY: I know it.

MEMBER SHAHEEN: -- $55 per gallon for fuel.

MEMBER QUIGLEY: Oh yes, right.

MEMBER SHAHEEN: But if you look at the demand elasticity on goods delivery, it's super tight.

MEMBER QUIGLEY: Yes.

MEMBER SHAHEEN: It's really, really tight because people are more used to the commodification of goods delivery services --

MEMBER QUIGLEY: Yes, right.

MEMBER SHAHEEN: -- as opposed to --

(Simultaneous speaking.)

MEMBER SHAHEEN: And so that's, I think, the behavioral mechanism that's occurring. And the hope of a commodified Mobility on Demand system, right, would be that we now start to really truly start to understand the marginal cost of a trip which people do not understand.

MEMBER QUIGLEY: No, they don't. Okay.

CHAIR WILKERSON: Yes, this is fascinating. The trip I think get turned off by highways platoons should become high speed rail. Joe's right.

MR. LEONARD: So Susan, in response to Tina's question, do you, I was asked this question like do I think there'll be more cars or fewer cars on the road.

MEMBER SHAHEEN: Yes, I get that a lot, yes.

MR. LEONARD: You know, in 2040. And I think it's coming. It's a guess but if you think, well, you're going to have all this shared use, you're going to have all this, you know, more efficient use, you say, well, we're going to have fewer cars.

Then you start saying well, we're going to have more trips because it's going to become, you're going to increase the productivity and capacity of the system so you're going to have more trips. So you're going to have a great demand for vehicles even if they're not individual ones.

MEMBER QUIGLEY: And that's a problem. That is a --

MR. LEONARD: And so where that balance comes --

(Simultaneous speaking.)

MEMBER SHAHEEN: That's where that, you know, that feedback, people in the system because I think the

problem isn't going to be, you know, formally distributed, right? It's going to happen during certain times of day --

MEMBER QUIGLEY: It's going to be intelligent.

MEMBER SHAHEEN: -- and in different environments. So maybe in rural areas we don't care as much because there isn't congestion, so that economic activity may be a really great thing.

But, you know, at peak, it hurts our system economically. So how we use feedback control to encourage higher occupant vehicle trips say during peak, are things we're going to really probably need to get into.

MEMBER QUIGLEY: Yes, it's all, I mean, you're talking about urban design now.

MEMBER SHAHEEN: Oh, the built-in environment's part of all of it, right? Because we can't build these cities here. It's not China, right, where we can just completely redesign the city. So we have to --

MEMBER QUIGLEY: Well, you were last fall like crazy.

MEMBER SHAHEEN: Yes.

MEMBER SCHROMSKY: Well, because my concern is as we were talking earlier, is we get to utopia which is not too far along, if it's a truly connected vehicle and I can take my hands off the wheel, I'm going to be working.

I'm going to be doing this right here.

So, you know, hopefully that's going to go to Leesburg and make that, you know, make that move in, right. I'd be doing, you know, hopefully providing all the connectivity but I mean, if you're doing latency and everything else, it's, because I can see that the vehicle is actually the office to some extent.

MEMBER QUIGLEY: I know. Now I no longer care that it's a 45-minute commute or a 30-minute commute.

(Simultaneous speaking.)

MEMBER MCCORMICK: Well, there was an interesting study I read a couple of years ago about looking at the difference in how Uber Lyft-type services, how the behavior changed. And typically, you know, I get in a car if I'm going to run over and pick up my dry cleaning. I might go to the grocery store, then oops, I go back to the pharmacy and pick up something later, then I make another trip to do something.

If your entire construct of transportation is through, you know, shared mobility and car sharing services, people tend, what they were seeing was that people will say, well, I'm going to go drop the kid off, pick up my dry cleaning, and do my whatever I got to do, pick up my drugs, pharmacy prescriptions, whatever, and then come home. It's a single trip.

And they had calculated that if you drive less then, at the time they said five thousand miles a year, that it made more sense to use a shared vehicle than not.

And I had real serious questions with that because my son at the time lived in downtown Boston. And neither he nor his wife had a car because a parking place in the financial district cost more than his rent did, right.

But there was six car sharing places within three blocks of where they lived and they charged $8 an hour. That included insurance and gas.

And when you look at the fact that the average person in the United States drives 200 hours a year, that even if he was doing that, that was $1,600 a year.

And we looked at the cost of your car about, your insurance, your fuel, your maintenance, the amortization of the garage that you have to keep the damn thing in, it's more than, an order of magnitude more than that at minimum to own a car.

So when we start looking at the fact that you combine car sharing services with some automation, forget completely automation, just say just car sharing services. The more pervasive they become, it's likely to have less car ownership but that doesn't mean there's going to be less cars on the road during typical driving times because,

you know, everybody still has to do the thing they need to do.

Lyft and Uber both started a program that said let's do this cooperative sharing so that if there's four of us here waiting to go --

MEMBER QUIGLEY: They've built car centers.

MEMBER MCCORMICK: -- you know, to a concert, to Moscone Center, you know, to work or whatever, we're all going generally to the same area of the shared ride and, you know, you divide the cost of your transit by four.

And I'm, you know, curious to whether or not that's working. But I think that there'll be just a lot of things being explored in that space.

MR. SHEEHAN: And others are getting to that of course as well. Waze way-finder, their attempt to recreate the local slugging in San Francisco --

CHAIR WILKERSON: Yes, that's exactly right. It's a micro, you know, it's unique. There are going to be niches everywhere. It's not going to work everywhere.

MEMBER SHAHEEN: But Uber and Lyft, they've set their wait times, their algorithm sets at three-minute wait times, right. And the further you get out from the core the longer you wait. But in order to achieve the three-minute rule as wait time, you have to have a lot of vehicles on the road.

CHAIR WILKERSON: Yes.

MEMBER SHAHEEN: So the notion that we're going to, it has --

MEMBER MCCORMICK: But you're not necessarily moving.

MEMBER SHAHEEN: And not necessarily moving.

MEMBER MCCORMICK: And those people would all be traveling one way or the other if it was their own car.

MEMBER SHAHEEN: In addition, we have to think about the circling time that's required to also make those wait times happen, correct? So there's all this deadheading that's also associated with --

CHAIR WILKERSON: Yes.

MEMBER SHAHEEN: -- the delivery, the pick-up and delivery of that person or that good.

CHAIR WILKERSON: Yes.

MEMBER SHAHEEN: So the notion that we're going to completely eliminate cars is a false notion.

We're definitely going to need high levels of fleets to accommodate the level of demand that we've come to expect.

I mean, back in the day when I used to do ride sharing research, if we could achieve a 15-minute wait time consistently and reliably, it was a winner. Now the expectation is, I've waited three minutes, that's a long

time.

CHAIR WILKERSON: No, you end up getting the

MEMBER SHAHEEN: So that's one of the great things that, you know, all of us in transportation are having to deal with, right, is, you know, how can public transit compete with this? How can a taxi compete with this?

MEMBER ALBERT: Just a comment, Susan. You know, it seems to me from some of the data that we've been collecting in rural areas, is it's the off-peak trip that is screwing everything up. Because more and more people are doing leisure trips or recreational trips or shopping in the off-peak and the off-peak now is beginning to affect the traditional --

CHAIR WILKERSON: The baby boomers.

MEMBER ALBERT: -- in the a.m. and the p.m. So all of the sudden there's less peaking and everything is actually flat.

MEMBER SHAHEEN: It's spread.

MEMBER ALBERT: But it's way above the demands, I mean, the supply side of being flat. And, you know, I got to believe things that we talk around here about technology, should be able to, and nothing else, reduce that overall peak and hopefully maybe do something about latent demand as well.

CHAIR WILKERSON: Are any of these topics that we've talked just now, do they fit within any of the other? You're talking about technology in a few minutes. So I'm just wondering if there's -- and that maybe to keep that in mind as we start to go through this afternoon.

(Simultaneous speaking.)

MEMBER SHAHEEN: -- that sometime this spring I'd suggested that possibly Scott's subcommittee would be an area where we could revisit some of the MOD activity.

MEMBER MCCORMICK: Yes, because two of the boards were all about aspects of mobility on hindrance of mobility and all intermodal aspects.

CHAIR WILKERSON: Okay. Any more questions for Bob?

MEMBER MCCORMICK: Thank you very much.

CHAIR WILKERSON: Yes.

MR. SHEEHAN: Do you want that in a statement right now or do you have a statement?

CHAIR WILKERSON: Yes.

MR. SHEEHAN: Great. Thank you for the good conversation there. So I think I have some notes as well. Just and I think it matches what we're doing and I laid some key aspects that maybe we should even join the program.

So another key area, and this is an affordable

one because it's cost heightened and it's going based by multiple offices in the DOT as well, and its focus on accessibility in accessible transportation and technology research initiative.

So this is a multi-year, multimodal effort within the DOT that came up years ago and we started an authored process to understand the fundamental user needs.

And then with this technology research applications and rotations. Fundamentally the program is looking at how technology can provide improved mobility, accessibility, for all forms of abilities, including disability such as sight impairment, hearing impairment, general mobility or ambulatory and then also cognitive disabilities.

So we see some of these projects occurring in other efforts such as a Smart City. So what we did is you see the back ground that we, to get to this program, very challenging. And 19 percent of the population has a disability unemployment rating, a poverty rating. Veterans with disabilities. 21.4 percent of Americans are veterans. So you have your number of disability claims. And that's increasing.

You see people who have disabilities from birth, people such as veterans, represent a unique group of people applying with disabilities or at a later station

in life in a more traumatic way.

All of their disability rates rise as people get older and the aging population is getting, trend is getting greater as we move into the next few years. Expect to reach 32.1 million by 2030.

That's a lot of opportunities. 76, so through a series of activities and stakeholder engagements over a two-year period where the team identifies through the user needs and through research from a contractor and the stakeholder engagements, and 76 percent of the people said the average education's important to their job search. And 29 percent consider it to be a problem in accessing jobs.

The programs looked at target populations and this was not just we didn't identify these bins, this is just based on engagement with the community. And target and verify types of disabilities and the various enabling technologies that we want to investigate.

Various models, prices through data, robotics, artificial intelligence, looking at not just virtual reality but all kinds of reality. And connected vehicles where we'll focus on the V2X as a trial within the system.

So the development process, so the intent here is to show we provided a process where we just kept funneling in the research into the next state of the

project.

We want to engage stakeholders for the entire process to understand primarily the user needs, engage other offices outside the USDOT, we're working in this area.

Move into the foundational considerations, get to our priority applications in areas and get into the current stage where we're developing prototypes with partnerships and learn the process now. And once all the awards are made then we can make the announcement of the selected parties.

CHAIR WILKERSON: So Bob?

MR. SHEEHAN: Yes?

CHAIR WILKERSON: Which government agencies --

MR. SHEEHAN: For example, one partnership's with, so with our announced, the allocations development, we are, we put a BAA, Broad Agency Announcement out for three areas and we'll get to those, and the other one for robotics, is being managed by the, by NIDILRR, National Institute on Disability and Independent Living, Independent Living with Rehabilitation.

CHAIR WILKERSON: What are they? Are they under a federal agency, or is it--

MR. SHEEHAN: That's through, NIDILRR is, not through the USDOT, the Department of Health.

CHAIR WILKERSON: Good.

MR. LEONARD: HHS?

CHAIR WILKERSON: HHS or DOL or?

MR. SHEEHAN: Not DOL. But we have, we're helping DOL. We're working with DOL in certain things in a, just community engaging the discussion.

CHAIR WILKERSON: Yes.

MR. SHEEHAN: But from providing funds and research, different offices in DOT as pipelines including our office, Federal Highway, Veterans Administration and NIDILRR has supported that research for project development for a robotics nomination as well as funding for data challenge and some other efforts.

MR. LEONARD: If I recall it's about three million that they're, NIDILRR --

MR. SHEEHAN: Yes, yes.

CHAIR WILKERSON: Thank you, sir.

MR. SHEEHAN: So through that process we have the user needs report available for the documented, the top barriers and the top user needs and top identified technologies. And that led us to, you know, our technology recommendations, focus on way-finding navigation, assisted technologies, automation robotics, data integration and providing enhanced human service to transportation.

And so through this process, we get into our

applications development. We have our foundation considerations, standard accessible data, universal design standards, recognizing integrative payment for multiple ways and better using existing technologies that led us to four areas for prototype development.

The three on the left or the two on the left and the safe intersection crossing on the right are managed by the USDOT team with representation from Federal Highway Research, Turner-Fairbank, FTA and the JPO.

So the key thing is although we see these individual elements, the pre-trip concierge is one step in the trip.

Way-finding navigation is another part of the trip. Safe intersection crossing and ultimately linking into the other modes is another part of the trip.

But for the system we want to see the complete trip and any breakdown in any part of the trip the ATTRI vision is no longer realized because you cannot take your trip.

And as we've talked about in Mobility on Demand review, door to door, inside the building as well as outside the building. Not only navigating the mapping for the roadway system which is a current part and I bet it came up in connected vehicle review, mapping positioning is a big part, it's a huge part for navigating for

accessibility.

And GPS breaks down in certain environments. You know, Bluetooth may just break down in other environments and may be cost prohibitive and so there are various ways to deal with it. The standards are being developed in different ways but that's a, it's not a barrier, an obstacle for this program, for accessibility.

So the complete trip solution's not going to be achieved by any one single entity. It's an issue that will be handled by DOTs, counties, MPOs, local cities, private sector, and communities stepping in to provide Paratransit service.

How do we deal with accessibility and deal with TMCs and providing wheelchair accessible vehicles over equity service or accessibility throughout the system to meet the requirements?

So we see it as a trip and that's what the research is focused on and that's where we're working now.

We have three projects to focus on way-finding that we expect to have. Also one on pre-trip concierge, another project focused on safe intersection crossing. And I hope to announce all those recipients in the next, hopefully within the month.

But we're moving forward now and those will be one to two-year projects for each one and hopefully soon

phase 2 work to continue and that includes standards development for all those supporting technologies. So these are the areas for our core technologies.

But this is a big part and so the other part lastly is, everything comes down to what we do over the next five years and what we do with the next 10 years.

This is the first, we achieved our first road map. We got to this point. We understand the needs. We understand what's at value in our prototype.

We're looking out, okay. How do we create an accessible environment by 2025? How do we take this true vision of a program of universal accessibility and embed it as a baseline for mobility?

No longer an add-on, it should be the baseline and so we're projecting out for the next 10, 15 years and looking at research to say, okay, we're understanding standards. We got to take that standard development process and support the standards.

We have to embed and say, okay, how do we integrate the safe intersection crossing with your transit service.

If I'm over here and my transit stop's over there and it's got a three-minute wait time before it says, I got to go but my pedestrian crossing speed is a lot different than yours. So you got to lower that to two

feet per second.

So we want to get to the point of readiness, looking at joint testing, getting a complete trip demonstrated, developing the guidance support tools and looking on a potential for 20 projects, there's an international project.

A scan over that here, where the team went out and visited Japan and UK, identified practices over there, focusing on, one project's called “Wayfinder.” It's a standard for way-finding.

And there's a partnership developed through Google at one time and we funded some projects at the Transport for London. And so we're seeing that connection to some of the standard development activities in the U.S.

But this, so this is the thing, the next slide for ATTRI. But it's a big part of our program. It's a fundamental effort for the JPO for the Federal Highway and Research office. And so we see a really good opportunity to move forward.

MEMBER JOHNSON: I have a question. So you mentioned just the three agencies, JPO, Federal Highway. And so I had a, my question revolves around the American with Disability Act for transit agencies relative to the mandate of Paratransit service.

And for those that don't know what I'm

referencing, pursuant to that, if you're not within three quarters of a mile of a transit stop then you're required to provide said service to those that qualify under the ADA.

So keeping that in mind, how do you see ATTRI, this program, sort of working in tandem with that?

Because I'm interested in the pre-concierge because that's the problem we get all the time, that the ADA, it costs transit providers. It costs my agency over $40 for each ride going forward.

And I know it's a very necessary aspect, but then again if you have this, you know, concierge whereby somebody could plan those, do you see it as a supplemental going forward or is this the model to?

MR. SHEEHAN: That's twice now you've drilled into a key.

MEMBER QUIGLEY: I'm just going to drop everything right now.

(Simultaneous speaking.)

MEMBER QUIGLEY: The program is the most inane bureaucratic antiquated system that there exists. You're right. It costs $40 per passenger. It's, nobody ends up happy.

MEMBER JOHNSON: Yes.

MEMBER QUIGLEY: It's never convenient for the

rider, everybody's unhappy in the end and it just doesn't make sense at this point that with all this technology --

MEMBER JOHNSON: Right.

MEMBER QUIGLEY: -- and all these research studies that are going on that we are not making significant advancements in that process, so.

MEMBER JOHNSON: Thank you. But that's what I was getting to, I mean.

PARTICIPANT: But tell us what you really think.

MEMBER QUIGLEY: God, I just don't get it.

(Simultaneous speaking.)

MEMBER SCHROMSKY: I was flying back from Phoenix and I was sitting next a couple and they were visiting their grandson who graduated from the University of Maryland and they're from Philadelphia.

Well, they were talking about Phoenix, have you ever been out there and they said they dread the day, they're probably in their early 70s, but they dread the day that they can't drive.

And it's not like they live, they live in Scottsdale so it's not a rural area, it's not in downtown Phoenix, but they drive a Prius and but they dread the day when they can't physically drive.

And you could see the fear in their eyes. And,

you know, it's a couple years out, they're like --

PARTICIPANT: What are you going to do?

MEMBER SCHROMSKY: -- we don't know what to do. You know, they're physically able but I mean, they shouldn't necessarily drive and everybody --

Well, I mean, is it Uber, I mean, that's one of the things they're looking at. Is it Uber or is it a service that government will provide and if that number, the elderly numbers, that's the biggest number.

(Simultaneous speaking.)

MEMBER SCHROMSKY: Is elderly, able-bodied but elderly.

MR. SHEEHAN: And so AP in place.

PARTICIPANT: Exactly.

MR. SHEEHAN: You have a place, you don't want to leave where you live and the mobility options currently available in the antiquated, like you explained, from 1950, is not supporting the needs that you'll have at that time. So you nailed it.

MEMBER JOHNSON: So Bob, getting back to the question I posed, are we looking at that from that vantage point?

MEMBER QUIGLEY: The question is, are you looking at FTA --

(Simultaneous speaking.)

MEMBER SHAHEEN: Well, we are in a sandbox.

MR. SHEEHAN: Well, yes, you've identified that bridge, that big bridge --

MEMBER SHAHEEN: Yes.

MR. SHEEHAN: -- between the two efforts, Mobility on Demand where partnership is with the TMCs and we see partnerships now where, for example, where MODS put out a, I guess, I guess robotic view on that and so it's the product of the TMCs to provide supplemental measure access.

MR. SHEEHAN: You talk to Uber or Lyft and they say well, they're private.

MEMBER JOHNSON: They are and how do you regulate that when you have somebody? Because having worked for robotics in years ago when we changed providers, there was somebody left out in the snow with her oxygen tank and she was running out of oxygen and were all working with the Washington Post and I had to fix that.

So the point of the narrative is what do we do going forward? I'm not attacking you, I'm very --

MR. SHEEHAN: No, no, you're --

MEMBER JOHNSON: So as a point of narrative, what do we do without this though because it's not efficient? These people are, not these people, but I'm saying this population is disenfranchised and they're

limited and they basically don't have the freedom to move about.

And to Tina's point, it's such a bureaucratic process and it has an enormous burden on transit agencies because we're looked at as the bad guy --

PARTICIPANT: Exactly.

MEMBER JOHNSON: -- like we don't care about this population.

MR. SHEEHAN: A good friend of mine and the co-founder of this program, he would say that every time I have a meeting like this he has to plan 24 hours in advance.

MEMBER JOHNSON: Of course. Right.

MR. SHEEHAN: He has to spend eight hours of the day dedicated to getting to and from his meeting.

MEMBER JOHNSON: It's hard. You have to make sure you're outside because if the Paratransit vehicle leaves then you're screwed because you weren't out there within the window so therefore you didn't meet the requirements. And if you have three no-shows, you're kicked out of the program.

MR. SHEEHAN: So is that giving that person independent living? Is that giving that person a quality of life? So we have multiple --

MEMBER ALBERT: I'd like to say something positive.

(Laughter)

MEMBER ALBERT: I think this is a fantastic piece of work and personally or professionally, I think you, your team should be really given a pat on the back because this is holistic. It's just outstanding.

PARTICIPANT: Yes, that is right.

PARTICIPANT: Oh, yes.

MEMBER ALBERT: I mean, I think, you know, anyone in this room probably has parents getting older so something like this is --

(Simultaneous speaking.)

PARTICIPANT: Peter was next, Peter was next, Susan, and then you.

MEMBER KISSINGER: I was actually curious if you're familiar with a senior supplemental transportation service, which bridged the gap from public Paratransit and these are typically trends driving trends programs.

PARTICIPANT: Yes.

(Simultaneous speaking.)

MEMBER KISSINGER: The largest most well-known in America which is quite innovative in the sense that when you're young --

PARTICIPANT: Yes.

MEMBER KISSINGER: Bryan, the people you talked about?

MEMBER SCHROMSKY: Yes.

MEMBER KISSINGER: They can just drive people places and book credit so when they become unable to drive they'll get true door to true door service for free by --

(Simultaneous speaking.)

MEMBER KISSINGER: There's, ICARE America's in about 15 cities I think across the country but there's a whole network --

PARTICIPANT: Started in in Boston --

MEMBER KISSINGER: -- of these supplemental transportation programs.

PARTICIPANT: New Hampshire.

PARTICIPANT: Okay, Susan, why did you change your --

CHAIR WILKERSON: So Susan was next.

MEMBER SHAHEEN: I know I just got tired of meetings. Some of the meetings I go to do that, right. So --

(Simultaneous speaking.)

MEMBER SHAHEEN: Yes, yes, so I have a comment and a question. So I feel you guys, Debra and Tina, I feel you.

Part of at least two of our MOD sand box evaluation projects are dealing with the interface with ADA requirements and it's tricky business to supplement or

replace typical Paratransit services with like an Uber or Lyft.

But part of what the sandbox is trying to do is explore what regulatory issues and environments may need to be altered in order to allow these things to become more efficient.

One of the things we're going to be looking at from an economic standpoint in the evaluation of the Pinellas Project, is how does a typical trip compare to the cost from Uber and Lyft providing those services.

But one of the things we're also going to be looking at is induced demand for travel that results because now --

MEMBER QUIGLEY: It's not a thing that, it's such a pain you really have to need it.

MEMBER SHAHEEN: Right. So I think that there's some hope in the works but it's tricky business.

And there's different industries that are invested in supporting the Paratransit ADA requirements for the core saying, hey, you have to demonstrate equivalent service legally and Uber and Lyft may not be able to do that because they may not have wheelchair accessible vehicles so it's a very complicated terrain.

But in an environment that we had talked about where we are moving more away from regulatory constraints,

these may be opportunities for us to explore further.

So but we hear you and I think this is not necessarily happening in atria but it's happening in the MOD sandbox and in the evaluation that Bob's leading.

MR. SHEEHAN: Yes, it's core and that's probably exactly right, so it's a core part of our divisions but now our core tech development in technology's going to key parts of the complete trip and that's where the bridge, that connection between the two.

And FTA even went so far as to contact Uber, Lyft, and RubyRide about equivalent service and data. And so this is a whole conversation about with Ariel and --

MEMBER SHAHEEN: Ariel gets her day in the sun soon.

MR. SHEEHAN: -- and FTA and IFA. And so we had a conversation with Lyft about a month ago and we have of course the meeting with Uber next week about that data for equivalent service. And so they get all the questions that he has brought and more to come up in that --

CHAIR WILKERSON: Sure. I mean, the municipalities and the agencies themselves are starting to have those conversations and then they were in a conversation with Lyft.

MR. SHEEHAN: Yes.

MEMBER QUIGLEY: So my only suggestion would be

a couple sites back where you had that circle, right there.

MR. SHEEHAN: Yes. This is new.

MEMBER QUIGLEY: Yes.

MR. SHEEHAN: Relatively new.

MEMBER QUIGLEY: So the complete trip, I would just say, ride the bus, if we could just throw a Paratransit reference in there someplace it would make some of us feel better.

MEMBER JOHNSON: Right but it's part of, it's like soothing noises.

PARTICIPANT: Not much but a little.

MEMBER QUIGLEY: Yes, I just want to know that it's not off your radar.

MR. SHEEHAN: Yes. Yes, it's not so but that's a good comment.

MEMBER QUIGLEY: Because it's low hanging fruit, I think, as it relates to really being, making significant impacts in people's lives.

MR. LEONARD: We ought to absolutely clear though that one of our objectives here is all of what you were just saying about Paratransit and how it's $40 a trip I have to plan 24 hours in advance and nobody's happy.

MEMBER JOHNSON: I heard three days, but yes.

MR. LEONARD: That's what we want to change about this. Could you imagine if all of you had to book

your Uber for tomorrow now and be there--

MEMBER QUIGLEY: Why would you have to pay three days in advance, so, yes.

MR. LEONARD: Okay, so --

MEMBER QUIGLEY: It's terrible.

MEMBER SHAHEEN: No, but we expect the Uber in three minutes.

MEMBER QUIGLEY: Right, right, yes. So you're willing to pay for the ancillary service.

MR. LEONARD: So I mean, this is about really trying to make universal access an equivalent of access in the transportation system so, you know.

MR. SHEEHAN: I read another project that's finishing, it finished a couple of years ago but we went with some planning grants the last two years.

It's the Mobility Service for All Americans, and that's just trying to provide more efficient delivery, and so, providing grants to four locations, San Luis Obispo, Denver, Atlanta, and greater Milwaukee, both improved their delivery and they're working with companies, Route Pass and Trapeze, to provide a more enhanced and efficient delivery in those services.

PARTICIPANT: Good. Yes.

MR. SHEEHAN: So we're packaging that up now in best practices, lessons learned, into an informational

guide and getting these people to talk to others. It is what we did.

(Simultaneous speaking.)

MR. SHEEHAN: So you won't see it as part of mobility in vision or recognize this is an important thing that you need to attack and address.

MEMBER JOHNSON: Right. And what Ken said about --

MR. LEONARD: And there is another piece of this and, Debra, you asked if FTA was involved in this and Vince Valdes has been a plank holder since he started this program.

MEMBER JOHNSON: Okay. Right.

MR. LEONARD: -- and Michael Trentacoste at Turner-Fairbank and JPO. And we've brought in, as you see here, NIDILRR and other agencies and we've talked to Social Security and HHS. And we'd like to expand that partnership. That bottom --

MEMBER JOHNSON: Veterans Administration, out of curiosity?

MR. LEONARD: I know that one of the longer conference veterans has been present --

MEMBER JOHNSON: Okay.

MR. LEONARD: -- because that is one specific one.

MR. SHEEHAN: And then show the areas.

MEMBER JOHNSON: Okay. Well, that's good. I appreciate that.

MR. LEONARD: Bob and his team did a recent rework of this program where we're trying to take a, like a decade-long view about where this is going. And even at that some of us didn't touch on, there's a whole redesign that's coming with automated vehicles and shared use automated vehicles that we've had some conversations.

You know, we're talking about Lyft and Uber and the problem being, well, they don't have accessible vehicles in their fleet because people are using their own vehicles.

As the design or some vehicles in the fleet design changes, there is an opportunity, particularly with some of these new start companies that are reimagining the transportation system to make sure that some of those vehicles can accommodate four able-bodied passengers but can also accommodate a wheelchair through, you know, some flip up seats or some possible changes to the interior design, so that you can put more accessible vehicles out on the street that can be used by people who don't need accessible vehicles but are there when somebody who needs a specially designed vehicle to accommodate a wheelchair.

So it's, part of it is making sure the supply

is there to meet the demand when it's there. So, you know, that's just another part of this.

So where the team is focused on is a lot of the elements to complete a trip but you can see how this starts to get into the things that we're working on. Mobility sandbox and also things we're addressing in the automation program.

MR. SHEEHAN: And it's interesting, we focused on wheelchair accessible vehicles a lot and I feel sometimes and we were if we hear, we go to ask some of the other disabilities and have the technology solutions for, for example, personal cab drivers under your way-finding and navigation, can help make sure your complete trip is being achieved step, or providing the necessary education to the driver who is now the provider of that Uber who now previously didn't understand the needs but now does.

And so if we engage that customer with that, I'm not sure what we can use here, but that rider differently, as opposed to the current method which is use your phone and if the car happens to be on the opposite side the curb. We're making those connections for user safe cognitive disability, you have to understand the specifics that a user needs for that person and they're different than others.

MR. LEONARD: The other, you brought up ADA and

I want to mention, Bob, you might want to expand on this, but in briefing the things that we work with this program internally, Bob and his team have been briefing a number of people.

And one group they just briefed was our civil rights group, Bob, and I don't know what feedback you got. I got feedback after suggesting that they get briefed but they were so excited because they said all the transportation issues we're dealing with are complaints -

PARTICIPANT: Exactly.

MR. LEONARD: And here you guys are actually doing something to try and solve that problem rather than us dealing with ADA as a resolution, you're taking ADA as a how can we make, how can we solve the problem and eliminate the complaints by making the system work more for everybody.

And so they were very excited about the promise of this kind of activity. So we're not going to get there a week or a year but we're serious about this.

MEMBER JOHNSON: Oh yes, I knew that. Okay. Thank you for that.

MEMBER SHAHEEN: Ken, I was going to ask and you raised it so but I wanted to just reinforce something that you said, is that what I'm seeing is the convergence of a lot of these ideas.

And it sounds like you are tracking the fact that the ATTRI Program which I was familiar with, is doing a lot of the same things that a few of the sandbox projects are doing and also automation along the shared perspective is also. So you're, so in terms of the overall strategic vision for JPO, you have this, you have all these roads aligned, if you will, and you're tracking them.

MR. LEONARD: Well, we are doing our, we are working to get that alignment. And, you know, when we have --

MEMBER SHAHEEN: It's hard.

MR. LEONARD: You know, there, you know, they're called cylinders of excellence, right. Instead of silos. We're trying to make sure that there's connective tissue between all of these issues. I mean, I talk about a strategic plan while we're on our six --

MEMBER SHAHEEN: Right.

MR. LEONARD: -- six major elements are all interrelated. When you talk about something like ATTRI, you can't, this program, if it doesn't connect to what transit is doing with Mobility on Demand, it doesn't connect to what the things you're doing with automation. It doesn't, this doesn't work without connectivity in a lot of cases --

MEMBER SHAHEEN: Right.

MR. LEONARD: -- because of the real-time data, the way-finding for people who --

MR. SHEEHAN: So for example, the use cases for automation. It's a key block for our ATNs, Automated Transit Networks. Use case for V2X in looking at mobile devices and specific users within that world.

Through the data onsite, for the trip navigations where you get into that trial oversight and so you're right.

And I mean, you know, it's the challenge with the connectivity to make sure that we're connecting those things in an efficient delivery but make sure not to lose any key aspects along the way, so. I appreciate everyone's comments.

CHAIR WILKERSON: That's great. Thank you.

MEMBER JOHNSON: Thank you.

(Applause.)

CHAIR WILKERSON: Okay. So I have let us pull over for a good reason. I think the conversation's been great and really informative.

Right now it's 11:38. I am recommending that we break.

PARTICIPANT: Lunch is here.

CHAIR WILKERSON: And do phone calls and what have you and then if lunch is here, we're here but we come

back at 12:30 and start with Ariel.

And then we do our break and then use the 2:00 to 3:30 period to start the technology discussions and that still gives us time tomorrow to go over the three other topic areas as well as use some time for next steps. Is that okay?

PARTICIPANT: Yes.

PARTICIPANT: Sounds great.

CHAIR WILKERSON: All right. Well, we'll break. Thank you so much.

(Whereupon, the above-entitled matter went off the record at 11:39 a.m. and resumed at 12:29 a.m.)

A-F-T-E-R-N-O-O-N S-E-S-S-I-O-N

12:29 p.m.

CHAIR WILKERSON: You have the floor. We're going to reconvene.

MS. GOLD: All right. So hello, it's good to see everybody together here, and thank you for your interest in data, so not surprising, especially the after lunch crowd.

So I've been onboard for over a year, and as Ken said at the outset, we're rethinking our approach to data, the recognition of a central role in this next generation of technologies in the transportation sector.

So I'm going to be giving you an update on some of the investments we're making, some of the ways that we're thinking about data from the JPO and for the Department.

I'm going to set the context a bit on just characterizing a little bit, just digging in a little bit more into what this means of data's importance, the context of it that we see, then get into the framing of where we're going with the data program within the JPO and in specific areas.

I'm going to try to get through this in about maybe 20 minutes or so that we can have a robust discussion

and I can go into more detail in any questions I hear.

All right. So again, the table setting here, broadly speaking, not just in transportation but broadly speaking in this new generation of technology affecting all walks of life have certain characteristics.

I'd say they're data-intense, but I don't just mean that there's a lot of data. It means that these technologies that we see are gathering a lot of data, using a lot of data, and give us actually the value, where the value lies, the value of the services from data.

We also see, particularly, a lot of venture capital-backed companies and others don't care about, like, you know, the day-to-day cost, just storing and sort of filing away every single bit of data. They don't care about throttling, right. They know that there's nothing to be unlocked there.

So the reason why I say this is that there's something about technologies where you can remotely configure them. It's not a problem. You don't have to think twice. You're just always updating things.

It's equivalent to the Cloud, basically. And you can tap into as much processing power as you need. There's also edge computing and, just -- there's all these technologies that have to do with the fact that these are not always, but by and large, Internet-based.

Developed iteratively, now that we're talking about casual development as another tool in the tool box, so it's as kind of the waterfall systems engineering approaches.

What you see, you probably see this all the time, but it's, like, we're going to just throw some stuff out there and test it, an AV test, and see what works, and then double down on whatever works and stop doing whatever doesn't work. So this kind of iterative design methodology is a bit of a theme that we see in this new technology collaboratively.

So we've talked a lot at the JPO for a while about absorbs, and when we pay to develop code that's it not proprietary. But an interesting thing you see in the test factor is you have these major, large companies backing up major open-source projects, right.

It's just when there are foundational elements of a particular technology set, the big players are collaborating and then making their money off of managed services or value-added products on top of that. So there's some interesting collaboration going on.

There's fundamental changes in appearances and expectations when you have these new players on the team where just the rules have changed. You expect to wait three minutes, you don't expect to wait three hours, three

days.

So it's, again, there's positive technologies that fit into this and they've arrived at transportation. This is what's happening. It's not just new widgets, it's not just a new crop of technology, it's a whole new paradigm shift. And the expectations for how you build and deliver capability is completely different.

So we're approaching it as if it is a fundamental paradigm shift on a few fronts which means new thinking of how we approach it. So it's not with more data. I wanted you to, like, yes, there's a lot of data coming. That's not it, that's not the thing.

Yes, there's a lot of data coming. But information technology and how it's delivered and developed is different, design and methodology is, like I said, it's agile, iterative from the technical approaches, as well in the smaller commute providers, the government that isn't the owner/operator, necessarily, the way it has been in the past.

And a big theme at AVF last week that was interesting was talking about how our sector is not -- they're not digital data. So all that stuff is, like, ah, yawn, old hat to some folks out there but not to a lot of the players in individual transportation ecosystems.

It is a major change that organizations take

years to go through if they do. And so how do we get closer for that in the future and near-term, right? Table Set?

MEMBER QUIGLEY: Yes, real quick.

MS. GOLD: Yes.

MEMBER QUIGLEY: These presentations will be made available to us --

MS. GOLD: This week.

MEMBER QUIGLEY: This week? Okay, good. Only because I have an executive retreat on Monday, and there's a lot of great stuff that you're presenting here that I'd like to able to show them.

MS. GOLD: All right. So let's go into that. So one of our deals that -- just to make this realized, because lots of the big picture I'm tracking, so we're not waiting. We're taking things on right now, areas, anywhere we can. And so I give an example of kind of the traditional approach and thinking of some issues.

So in the traditional approach, or a traditional ITS project, you would have this basic architecture where I'm putting some sensors out there, and then I have probably a dedicated back halt to my transportation management center where I do whatever operations they need -- that I set up too. And it's great.

You know, you get these point solutions that do

what they're meant to do. But then what happens is, okay, wait, then are some other third party data provider comes along and says, hey, I want to do a data exchange with you.

And you say, oh, it's going to be a million dollar change order to my, you know, service provider. It's going to cost me people-time that I don't have. That's going to be kind of hard. Maybe you can make it happen after a year.

Or, oh, if you just need a piece on a new project, and there's all these kind of vague requirements about data sharing with the evaluator, or with the public, or this or that, you didn't really think about it up front. It was kind of an afterthought being added. There's always demands on data that come up. And without thinking about that in framing the architecture, it's really hard to do.

So I'm going to hold up while we see the pilot, those awesome example of changing this approach. Assuming data fluidity, the need to move data around for various anticipated/unanticipated purposes, is the norm, not the exception, and that we can do this in a way that protects privacy and keeps down cost.

So this is a bit of an oversimplification of their architecture, but you can see here we've got the data sources. They've put the virtual router in the middle.

But, you know, the first project that I'll talk a little bit more about is at the USDOT. It's sponsored.

Still, their data's effect their TSD, no negative-impact operations. But our independent evaluators need some data. And we have near real time feed to research data archives that operate these and just make sure only the right data goes out there.

Well, we're also wanting to share data with the public, okay. We've got a lock on here that filters the data to meet their privacy protection needs and sends data in near real time that they're worried about for the researchers.

Since they've gotten better at their -- we don't want to have one-on-one relationships with a given deployer. They want to be able to abstract that out. There's been operational data exchange that the USDOT has delivered to the process system that some of their vendors are plugging into. So this is just a very simple change but revolutionary in going to meet near-term and long-term needs.

So with that, again, and you cut in if you want. I'll ask questions online, and set it up again. So at some table setting, what are we doing? We're looking at how do we make the system itself more agile and future-proof.

So it's multi-modal where it tracks a partner

with as many modes as possible and brings their proposal onboard. We're looking at data management throughout the life cycle, throughout the transportation ecosystem to support this next generation, not only technologies but business models and design methodologies, as I referred to earlier.

So it's foundation, fragility, data sharing, privacy protection, you could layer on cyber security and other needs in here, right, and to maximize if the file does it. And we do have a new fact sheet that you can map, you can scan, or whatever.

MEMBER DENARO: Excuse me.

MS. GOLD: Yes.

MEMBER DENARO: I have a question. Could you go back to the vital means of protection?

MS. GOLD: Yes.

MEMBER DENARO: So what's the difference between the control to research data archives in the public one?

MS. GOLD: So they happen to be two different data systems that we need a few here managing. It's just being able to make data that has no restrictions of privacy or proprietary available to everybody versus being able to have higher restricted data for independent evaluation purposes. You probably thought of it before as the

Richter's Data Exchange.

MEMBER DENARO: Yes.

MS. GOLD: We're going to talk a little bit about how we're revamping that. And then this is at the center of being set up just for CV pilot evaluation but in an acceptable, replicable for other --

MEMBER DENARO: And who makes the decision on what's able to be made public?

MS. GOLD: It's up to the site and their IRBs, so I guess in, you know, discussions with the USDOT.

MEMBER DENARO: Yes, okay.

MR. LEONARD: But that would also include certain PII kind of information that we would not release.

MEMBER DENARO: Right.

MR. LEONARD: But that we would --

MEMBER DENARO: Is the onus on you or, you know, your Department to get it right?

MR. LEONARD: Well, we have agreements about, you know, our research data.

MEMBER DENARO: Right.

MR. LEONARD: And so, yes, we try very hard to -- you may recall it took us a long time to get some of the Ann Arbor data out --

MEMBER DENARO: Right, yes.

MR. LEONARD: -- because of trying to make sure

that we were stripping out the privacy sensitive information. So we had that data, and we were analyzing it in a controlled environment, largely invoking NHTSA. But we didn't make that information available to the public, because we didn't want to expose privacy --

MS. GOLD: Yes. And so with the safety pilot data, we ended up about, I guess, four years after the project started getting a sanitized upset which we then made available to the public there on the RDE.

So learning from that process, another thing that I kind of said in passing that's quite different here, and it is how we would love to see things going forward. And it's that the privacy considerations, if we make them from the beginning.

And so the approach is very, very rough, easiest to implement, lowest risk approach, remember, iterative practices, right, for the CV pilot in Wyoming that has been implemented here. So actually, as of last week, we are into live data going here that's already been filtered.

And if anybody would like to see the data, these are public. We'll be proposing to give feedback on it. We've updated the safety messages now, ten messages coming soon. So that when they go live in the fall, it will be a near real time feed to both the public and the NDOT=for input.

MR. LEONARD: So, Bob, that was a really important lessons learned out of what we did with Ann Arbor. It took us forever. We had to make even 30 days' worth of data variable. And that impeded outside entities' ability to verify the data, utilize the data for their own purposes.

And so we took that lesson to heart and said, you know, we want to be as transparent with useful, scientific information as quickly as possible. And so we've figured out some new approaches to designing our data input to make it easier to share information and still respect privacy.

MEMBER DENARO: So do you have some kind of requirement then to disclose to participants of how their data might be used and that sort of thing? So example, if I volunteer out in some program and my vehicle is sharing data and so forth, do you have a requirement to give me something that I can understand how my data is being used or not?

MS. GOLD: Yes. So all of our projects that involve either subject have IRB approval. And that responsibility is pushed down to the grantees, in this case, USDOT. So they have priority oversight. All three sites have their own IRB.

And really, the leg up at the negotiation between what data is meaning for research outcomes, and

validation, and that kind of thing, and privacy protection is important in all that. So usually the three sites have that relationship. And we, essentially, support them.

MEMBER BERG: That's great, kind of handcuff your innovation to what your intended outcomes are. So if you make data available to public or private entities, I think you can gain a lot more innovation just making that available so people can say, oh, now that I have this data, how could I use it?

MS. GOLD: Absolutely. Which is why we are committed to doing that. And I'm going to talk a little bit more about the investments we're making there. It's just that we're not a BC-backed company with no care in the world.

We do think through the specific use cases for the data to get it started. And then we advise, you know, it being used for all these things. There's a rationale for asking for more. And so we are, again, we're committed to making the data available in near real time. And we invite people to come in and use it and show us why it's working out.

MEMBER SHAHEEN: So in terms of the Cloud's data, are you envisioning to assign any of these Clouds to give you research results or offer them for things that have been applied?

MS. GOLD: Yes. One of the kind of principles for mining all that stuff is, as we have to roll out of this federated national system of systems, that we need to recognize data has gravity in separating tools from data instead of bringing data to tools. By that I mean we're not going to be able to if we download it from all those different places, and then you use your little stuff. We wanted it to have gravity where different researchers, different users can upload their own tools, share in these environments.

So particularly for something like this, controlled access research data archives, that's one of the kind of principles, architectural principles we're taking.

And I can geek out on this. I will not do it right now. But there are some thoughts in the research base, the idea of the executable paper where you have your paper, your hypothesis, your results, the algorithm you used to generate it, the baseline data, the results data, all packaged together in a way that anybody can reproduce it and iterate on it.

So we're working with the National Transportation Library who has the statutory obligation to make federally funded research results public. We're working with them on new tools that bring the research, the algorithms, together with the data.

MEMBER SHAHEEN: Yes, right.

MS. GOLD: And also, vision just -- we're looking at this being a big system, right. So cost, and scale, and interoperability, collaboration is a fundamental probability to take on this really big paradigm shift.

So we are looking at new ways of spurring on collaborative development of interoperable resource tools that can then be taken by vendors to make into products that are sustainable in time.

We are really looking at data and privacy being together, because that's where the privacy guideline principle can be applied, but also allow the data fluidity to address different needs.

And then we do participate in a workforce development and training exercise, and the fundamental track here, partnering with the program and others to execute.

So with that, we're investing in four main areas right now, so we can have bucket things to wrap our heads around in. So they enhanced their project data. This is an evolution. And, again, what you've seen before at the research data exchange, and I'll pull on that thread a bit more, according to FOIA Department Services.

And you can say that this is agencies, researchers, whoever is deploying in this brave new world

collaborates around development of products and services, kind of technical assistance type work, we're very much on the ground, and I wanted to bring that forward.

And then engagement, communications, filling capacity, allowing iterative design practices depends on having a community who's willing to put some skin in the game, who's willing to work with you. So we go from just communicating out to really cultivating users to work on things with us.

And then I'll talk about the strategy, what is this all building up towards? It's not just a bunch of little pieces. So again, please feel free to access the data.

We're in the midst of making a migration which everybody will see in the next few months. But where we're going is thinking less about there being a system that houses all data to the idea of federated systems of data where we partner wherever possible with shared services, with the Department, have data.transportation.gov, the National Transportation Library.

We've got third parties, we've got different deployers that are hosting data. But at the end of the day, when I want to make our data, the JPO funded, or ITS relevant data available users, they don't care where it's posted. You need to know policy.

MEMBER SCHROMSKY: Where do you store it, I'm just curious?

MS. GOLD: We've got a few different places. So this is divided with the CIO's Office of the Department. This is your identification statistics.

MEMBER SCHROMSKY: Is it your own data center or is it actually AWS or dual --

MS. GOLD: So this is currently based on the product of the software service platform. It is posted in the Cloud. But they take care of the listings. NTL, I don't know if they probably announced they're partnering with another federal department which uses Cloud listings. And then we're looking at different options for having sandbox kind of capabilities. But the JPO is not managing our data center.

MEMBER SCHROMSKY: Just curious, because a lot of times, when you get into the story about accreditation rights, or those of FISMA, that branch starts coming up.

MS. GOLD: Yes.

MEMBER SCHROMSKY: And if you want to start accessing third parties, you kind of go outside the security perimeter, and you have to start putting DMZs, right?

MS. GOLD: Yes. So we work with the CIO's office around getting different IRB approval. That's a

review board going through the process and all that. But, yes, approaching that, cyber security hygiene in a federated environment is a part that's necessary.

So what you'll be seeing soon is ITS.dot.gov – our website -- /data, which will be one of few windows into our data which will be listed in various places. And this is a public-facing view, right.

We're also looking at rolling out new contract language to build upon what we wanted our contracts in the past to require data be shared with the Research Data Exchange to follow that Wyoming model requiring data to be provided in near real time and just educating everybody on what that means, having to make that happen, how to build in privacy by design, just kind of getting some good data hygiene throughout the ecosystems for making our research dollars go further.

We also are, again, looking at the controlled access environment, working with the CIO's office at the Department. The Department doesn't currently have a kind of shared service around making controlled access data available to researchers. But we need it absolutely for the ITS space, so we're partnering with them on testing out new capabilities as well as for operation on real time.

So I can, yes, say a bit more on that if you're interested in talking more about that area, which you are.

MEMBER DENARO: Do you, as far as the public data, do you at all record who is accessing the data and, for that matter, what they're doing with it?

MS. GOLD: So the current Research Data Exchange, which we've managed directly with the Federal Highway Administration, requires registration.

MEMBER DENARO: Okay.

MS. GOLD: So we have done insight based on that in surveys. So we know what's been popular, what's unpopular. And we get a little bit less excited, probably, in the data.

What I've tended to see worthwhile is the kind of as open as possible voluntary registration kind of things that access data but to get access to APIs and other more programmatic services that it does require registration for a variety of reasons.

So philosophically, I love the idea of having really great insight into everything everybody's doing. But I think that we need to balance that with those areas for --

MEMBER DENARO: Well, there's probably a transition too where in the early stages you're kind of experimenting with putting stuff out there, and deciding what to put out there, and so forth.

MS. GOLD: Yes.

MEMBER DENARO: In the short term, it might be nice to know some of that. And then as you learn and get confidence, then basically --

MS. GOLD: Yes.

MEMBER DENARO: -- be more open.

MS. GOLD: Yes. So when I think of each data set as a product, and especially, you know, the millions of dollars that goes into developing these data sets, I think that's the right approach.

And so, for example, with the Wyoming data, we've got some test data coming in, and I'm serious when I say I'm looking for data users. We're looking for people who are really excited about this data, who might want to use it for their products or for their research, to come in when it's still kind of raw and give us feedback on how we're structuring the data.

So if they wanted the real streams, it gets pumped out there. And right away as many people as possible are going to find it useful, and acceptable, and programmatically of quality in the documentation that they want, right.

And so through that, I found that you can get early new cases, right. Your data users are often your testimonials and can spread the word. But treating our data as product, I hope to get some of that and, again,

spiral back, see people talking about it. They want to talk about it too, and just make it easier for people to share relevant data.

MEMBER MCCORMICK: Is there a formal request for users of the data? And the reason I'm asking, if there is, I can push it out to the 20-some thousand contacts I have world-wide.

MS. GOLD: Yes. So I think right now we probably might like three trucks going around. We're probably not at the point where we want that much advertisement. But in the August/September timeframe when we roll this new thing out, we would love for all of you to reach out to your contacts and really augment the message.

MEMBER MCCORMICK: The other thing is, I went to the www.its.gov/data. And it says, "The page you're looking for has been moved."

MS. GOLD: Oh, we haven't gotten online yet.

MEMBER MCCORMICK: Oh, okay.

MS. GOLD: Yes, yes.

MEMBER MCCORMICK: No, okay. Thank you.

MS. GOLD: You all are getting a preview of, I mean, the hope is that our different partners, including some different sites, we're “templatizing” it, so you can just stick it in your content management system.

Because it calls back to APIs that sit in these other catalogues, so you can represent -- you can use it. All I care about is our weather data and just pre-builder or for all of those other data that we saw posted, and just create a page that advertises we're weather data. And we're going to make it super-easy. In few minutes, a developer can put a page up. So that part of -- oops, oh, hello.

MEMBER SCHROMSKY: So question, is it mostly just one way of users going in and pulling the data? Are you encouraging, after they do the research, to publish that information, not to their own university or consortium but back into the exchange?

MS. GOLD: So we have to look at the sustainable model for that. At the very least, we'd like to advertise it to create a catalogue entry. But their testing optimization for data that has been updated, transportation-type data, which is automatically tethered to data that I have, is quite high.

So you get some data that's from just the gravity of that, right, plus being able to host the world's ITS data. Hum, we've got to be careful about that. So on a case-by-case basis, I think it's worth talking about.

But as of now, we're funded and other DOT key-funded projects that have permission. But we're open to

it. That's where the federated stuff comes in. It's more sustainable. It's hosted in different nodes, and we can just run the community together.

MEMBER SCHROMSKY: Frankly, we're concerned about the cost.

MS. GOLD: Yes.

MEMBER SCHROMSKY: Oh, yes, we know, hosting's not free.

PARTICIPANT: Right, right.

MS. GOLD: But one of the things we're getting -- I want to emphasize we're not just about metadata standards. We're about, like, the clearance for the actual schema and the Cloud. I talked with them both.

So we're really looking at this and not determining a schema for data, but how it's actually structured in the Cloud, right. You've got a bunch of commercial cloud providers. So you could have lots of different nodes in a federated environment. And we could just give some standards or whatever instructions for how to do it securely and harmonize.

So for a user's perspective, they could call from, like, five different nodes and not even know that there are five different organizations running them. So we'd like a division. Yes --

MEMBER SHAHEEN: So you talk about this idea of

a life cycle for data management. So one of the first things that, you know, any researcher's going to deal with is the integrity of the data, so data cleaning.

So how do you see data cleaning, that iterative process cleaning the data so, say, one researcher might be a third party, go in, do a kind of cleaning. Is there a way to preserve that clean dataset?

MS. GOLD: Yes. So we're still figuring out the specifics of this. But yes, the first thinking that we're playing around with and doing for the project, or for the concept work around is that by the time a data set, like, just for one of these kinds of catalogues, there are in a pretty stable state and of a certain quality.

But before that, especially for early stage data, which is the stuff that we tend to fund at the Data Bureau, it needs to go through that iteration. And the weather data environment is a great example of where that's been done.

So we're looking at the concept of the sandbox environment. Very, very no frills, just basically pump some data into Cloud buckets. Whoever wants to come in and do some of that R&D kind of work, develop the quality chart, do the updates in the stuff that -- over the course of a few months, when it is first being collected, we do that.

We settle on what is good enough they look like. Those algorithms that were developed to make the data better quality goes into our open-source toolkit. And we just run it as --

MEMBER SHAHEEN: Got it.

MS. GOLD: -- part of the interest, right. So that's kind of the thinking, but we don't want that to last for two or three years. We want that to be up front, loaded up front for the first two, three months or so, or when a new source of data is being collected, and then push out the community so we don't bring that.

MEMBER SHAHEEN: Yes. So it's just a practicality, right, in the analysis area, right --

MS. GOLD: Yes.

MEMBER SHAHEEN: -- is if you don't spend a lot of time cleaning your data, your analyses are going to look different than somebody who does.

MS. GOLD: Yes. And also, for somebody who's doing evaluation work like you, you're always going to have to do more cleaning and snapshotting than the average, right. So what we're looking to do is what is the minimum needed to meet the maximum number of feeds. And then different users will have to take it into a further work environments.

MEMBER ALBERT: A comment and a question.

MS. GOLD: Yes.

MEMBER ALBERT: A couple of projects that we've had, like, the Northwest Passage that goes from Wisconsin to Washington on I-90 and I-94, we scrubbed all the data coming off of all the DOT websites and put it into one. And it took a lot of scrubbing --

MS. GOLD: Yes.

MEMBER ALBERT: -- and a lot of institutional arm twisting just to get data.

MS. GOLD: Yes.

MEMBER ALBERT: That's a comment. The second part, as a question, is do you anticipate using this data, I guess, for predictive modeling, like, if there's snow on 80, if there's winds blowing, i.e., up, that's a formula for predicting that we're probably going to have an accident out there during these time periods. Because that's what history has shown us. Is it planned on that kind of third party data or just in terms of whiteout data?

MS. GOLD: It's likely that there is mostly going to be third party providers that match up all this stuff and create the capabilities. Direct DOT funded projects to try to accelerate development of those kinds of things were just integrated, small road condition prediction.

So they're trying to just jumpstart work in that area, there's a type alert, Vehicle Data Translator tool that does some of that, bringing in situational data, weather data, connected vehicle data, or with data together that's part of the Wyoming deployment. And you all --

MEMBER QUIGLEY: We did that.

MS. GOLD: Yes.

MEMBER QUIGLEY: Same stuff.

MS. GOLD: Cool. So I see this family of investment as being a test bed, sandbox, on top of which such new capabilities can be tested. And then there's the -- I think that there's proof of concept here on the controlled access data. That's even better for being able to bring in data that we get from third parties that we can't share publicly, right.

But we're looking for others to come in and do their R&D work on top of this platform or the platform that exists on the system. Some of it might be JPO or USDOT funded, some it might not be. But those are the users, let's say, of this.

MEMBER QUIGLEY: Thank you.

MS. GOLD: It's like a fee system. I'm sorry, back to your first comment. Oh man, unless we start talking about tracking in from legacy systems, a holding body, and that's really been a big thing with --

MEMBER ALBERT: We've learned a lot.

MS. GOLD: -- Smart City, and other things. So this wonderful Utopia that I described to you is mostly talking about draw a line in the sand, we are generating new data, let's do it right from the beginning.

When we go back to legacy systems, that's where the real IT modernization comes. Again, I'm going to stop and --

MEMBER QUIGLEY: I was going to share already the predictive analytics. We just partnered with a company called “WayCare.” Has anybody heard of that? It's exactly that, predictive based on data. And we're doing, like, a six-month partnership with them, although they're giving the data related to our highway division, and they predict where collisions are occurring, collisions will probably happen.

And then what we'll do is have metro, and our police department, and our emergency responses located within those areas where they're predicting, just so we can have more units.

MS. GOLD: So this is a kind of newish idea. So I know that there's a long legacy of technical assistance work. One of the things that we're trying to do is see how much of the puzzle, when it gets distributed throughout the ecosystem, all these thousands of data sources, single

government researchers, website providers, highly distributed, what can be prioritized, meaning you take a problem, you develop a solution, and then lots of different folks can implement it.

And the first really good example of this approach is that ODE, that digital virtual router that I talked about further winding up being DOT.

So the idea here is that in the connective action environment you want to be able to, you know, move data in real time from point A to point B. And new data sources and users will pop up frequently, and you need to validate, or integrate, or sanitize, or aggregate.

The data that will come up, and wouldn't it be great if it could be standards-based, and updated if standards change, and help with some of that data harmonization and operability issues?

This is not processing of data for applications. This is really fundamental nuts and bolts getting data from point A to point B to authorize users to a level of quality and protection in their aggregation as needed.

So this is, if you go to this URL, you will see it. And you'll see a lot of activity, and I took the screenshot just yesterday on those 14 other “commits.” Wyoming, is our first partner in this, and they're actively using it. We've got a couple of other beta users in there

as well and a list of interested parties. So if you're interested, come join the party, great.

So one of the things here is that we're now starting to see different modules that can come out. So a project that was separate that now is kind of part of this framework, called the “Privacy Protection Module,” we've been working for a few years now with Oak Ridge National Lab.

They've been analyzing the privacy environment for connected vehicles. And they're the folks who taught the algorithm that sanitized the Safety Pilot data so that we could share publicly.

My challenge to that was a low density, high speed puller environment like the Wyoming pilot, is there something simpler we could do? So they put their heads together with the Wyoming team and others and came up with something that was just a simple filtering tool that you can read all about here.

And we open-sourced it and put it as a module that can run by itself, be put into any system or just be put in the middle of the operation data environment.

So we're looking to see what other kind of modules can be standalone but also plugged into this or any other environment. So this is not something that the USDOT runs. This is something that the deployer runs at

the point of generation.

We've paid for the development of the codes that come out under the standard documentation in the test script. And we hope to hand it off to the community to maintain going forward after the startup period.

So there's a couple of other things, looking at sharing of policies and institutional learnings on network exploring as well. And we're excited about seeing where this goes.

All right. Engage, communicate the capacity -- it's pretty basic. When you tell a story about it, it's really hard to communicate effectively around data stuff. I'm really excited you all wanted to talk to me for 75 minutes.

MS. GOLD: No, seriously, you have 75 minutes to talk about this? But, you know, right, like it's hard to capture this fundamental change, and all the things we have to do, and how we're doing it, so trying to get a little bit better about that and tell the story, still working on it.

MEMBER QUIGLEY: And, you know, when we get ours we put that in AMCTD. Did I do that right, AMCTD, grant --

MS. GOLD: It's a grant.

MEMBER QUIGLEY: But it's a grant -- yes, that

was a big concept which is the collective, you know, having that collaborative collection of data bringing every piece of data all together centrally. It's, like, our report will have to be sexy. It's, like, well how do we do this? How do we make --

(Simultaneous speaking.)

MS. GOLD: It seems like at the top of the hype cycle, the less --

MEMBER QUIGLEY: Yes.

MS. GOLD: So the hype will go away and everybody will say you just spent millions of dollars on all these pilot systems that didn't work. Like, we stalled, the system doesn't function, like, efficiently and whatever. So was I --

MEMBER QUIGLEY: You said that. We just made the picture, so I won't go there.

MS. GOLD: Texting data pictures, wow.

MEMBER MCCORMICK: I just want to mention, for the group that the last one she just showed us, I just looked at it, and it had that sort of a code there. It has land line codes, it has job codes there for a variety of functions. I don't see the taxonomy yet, but I just looked at it. And so there was lot of useful, reasonable stuff there.

MS. GOLD: It passed the sniff test.

MEMBER MCCORMICK: It did.

MS. GOLD: No, it's -- we're pretty proud of it. We tried to just take one project-iterative approach, one thing, and really went all in on as all the source.

We have a two-week spread. It gets demo-ed. Any new functionality gets demo-ed, and it doesn't get accepted if it's not documented up to our specs. You have a testing script for the demos that are published. So their reproducibility, and integrity is really a big part of it.

MEMBER BERG: Can I just make one comment? Have you been considering the sensibility of systems like this? Because, you know, now we're talking connected vehicles, which is, you know, the outcomes and related stuff. But if you start talking about, you know, onboard testing, the amounts of possible data and how useful little elements are that's posted from -- derived kind of contents, it's really, I think, a reasonable research question for the JPO and associated agencies. So have you thought about that?

MS. GOLD: Yes. So again, in a perfect world, we would be able to get all the data off just, like, one A and D and just really see the art of the possible of all the data that's there and then kind of down select what's actually needed against their public interest questions.

MEMBER BERG: Be careful about that, because one of the things that we talked about in one of our sub-committees is the idea of cooperative automation, but not just connected automation, not just individual, you know, ego automations but actually cooperative behavior, cooperative automated behavior based on connectivity.

MS. GOLD: So one thought on this is, again, perfect world, we would suddenly have access to all the data for a short period time, at least, in order to figure out all the things we could do with it that are useful.

That's not quite how it's probably going to work. There will be certain places that have access to more data than others, but there are pivotal points of collaboration where everybody's values are aligned. And so that's one thing to look at for these newer technologies. And we can talk about that more at the strategy discussion.

The big theme at APS, there were 25 breakout sessions aimed at -- almost every single one of them had a bullet point for, and we need to share data. And as a data person I'm, like, come on, right?

But there was one actual breakout session on data sharing and those tend to work when it's focused on specific small problems. You build trust, and then you build out, right? So if you look at these kind of data sharing things, the repository side of it, we're looking

at different partnerships and different models. There are different ways to do it. There are a lot of equities there. We're very much looking at it.

When it comes to getting harmonized data from all the different sources, that's where this kind of tool set approach works. There is one OEM I talked to last week that saw the promise of this kind of a tool where stable agencies that they want data from, like they want work-zone data, right.

One big grant is for us all to get harmonized around a schema for work-zone data once and for all. And then one option for making sure you comply with that schema is that you have the interface here that's already complied with that schema. And anybody who wants to provide that harmonized data just uses that widget, right.

And then for the AV and the OEMs, whoever, if they're doing testing, they can contribute code to this project, that says I'm going to have all of my projects generate data via this interface.

But there's some stuff we can start doing here even if we don't all have access to the same data to start having hygiene around -- harmonize the instructors, and stuff that if, when it is shared, it's easier to keep it.

MEMBER MCCORMICK: The only problem I have with what I saw --

MS. GOLD: Yes.

MEMBER MCCORMICK: -- is that there's not a morphology in it. When you have, you know, a government command line item followed by a Java line, followed by an XML line. And some of them are things like boom and length, you know, so it's not a very well understood --

MS. GOLD: Oh, yes. Oh, that's what you get for having one user and scrambling.

(Laughter)

MS. GOLD: So I look forward to this getting, you know, better when we have our third, and our fifth, and our tenth user, yes. Winter is coming, and we need to finish in time for a winter to come to Wyoming.

All right, so engagement and capacity. One of the capacity building things that I'm excited about, this is quite a challenge, is looking at training your own folks within the USDOT and then state and local agencies on how to procure, do post work management and focus first on agile projects.

Going from saying you want to do agile, or do open source, to actually procuring and managing projects, oh, man, it's hard. So we have the tools in our tool set, and that's one of the first kind of training things that we're taking on.

And engagement, if you're on our Rolodex, yes,

you should be in our Rolodex, and then we'll hit you up when there are opportunities we think you might be interested in.

So this is a part of, again, as I said, I've been onboard for a bit over a year, and everything I've presented until now I consider tools in the toolbox, it's not the entire tool set that we need, but it's the muscle we need to build, ingredients in the pantry.

I could use a lot of different metaphors, but there are things we need to be able to do. They need to not be foreign, because the new technologies, the new players, they're digital natives, and these are the ways that they do stuff. And we will benefit from it on our own and also by being a fully integrated system, but then the question is to what others.

We could just focus on any projects that the JPO funds, just making sure that they're really good, right. So Wyoming was already half-way along and said, okay, we'll change a little bit of what we're doing to incorporate some of these ideas.

Columbus was kind of baked into the notebook from the beginning, whatever we do next, right? So we could just focus on whatever the JPO funds, exemplifying these principles.

But we do think that we have roleplaying formula

across the nodes and across the transportation ecosystem to identify problems that are inherently more bimodal, and multi sectorial in nature, that require sharing data across traditional organizational boundaries, that's kind of the nexus.

So you look at how do you validate an automated system is safe enough to operate? How do you go from zero to sixty on this smart city concept or mobility on demand? How do you do traveler-based performance measures and not throughput a vehicle, some of these, like, big honking challenges.

So we're having discussions to see where there's alignment around setting up a framework for taking on those really big challenges, some initial places to invest and start, and apply some of these methodologies in the real world. So I'm going to stop for questions and discussion.

MEMBER DENARO: You should have bikes.

MS. GOLD: No.

MEMBER DENARO: No bikes?

MS. GOLD: But there is a bike downstairs, behind the valet, because they have no bike lock areas here.

MR. LEONARD: Wouldn't you have want to have had that thing before we --

MS. GOLD: I wish I had -- I wish that when I

had used the mapping tool to map going here and use the bicycle function, it would have sent us a big warning. There are no bike racks at -- That would have been nice.

MR. LEONARD: So in an ideal world we have all the transportation data we need including the location of bike racks. We do not live in an ideal world.

MS. GOLD: We do not live in an ideal world.

MR. LEONARD: And I don't want to, for the moment, suggest that this project is going to be grand theory of data unification for all of ITS data.

But there's a part of me that feels we're 15 years behind on the data collection. I mean, these are questions we've been trying to take on in transportation since September 11th. And we have the data around the network, but you can't integrate it.

And so that's what Ariel is really focusing on here. She's doing a lot of work across the Department. And this is not just a JPO activity, because we're working with the chief -- DOT's chief data officer, and other people involved in data. And every day she's finding new people who are involved with transportation data. And what we're trying to do is really just focus on a subset of that which is ITS data.

MS. GOLD: Right.

MR. LEONARD: And even that's an immensely

large amount of data. We do not have the resources in terms of people, money, time to be able to address all of, you know, to create that ideal system.

So this framework is a start and recognizing that there's going to have to be a private sector role in this, the whole notion of federation is going to be critical to this.

But if we don't do this, we will get 10 or 15 years further down the road. And the work zone data coming from Wyoming will be different from the work zone data coming from Idaho, and the Dakotas.

And now you're going to have to design a box that can translate 50 different work zone messages, because we haven't made any effort to synchronize the data communication in terms of ideas.

And so that's really what we're trying to get to here, recognizing there's going to be data coming through connectivity. There are going to be tremendous data needs automation. And you don't need all the data all the time. You're driving in a blizzard in Wyoming, you need information that you do not need in Florida, right.

MEMBER ALBERT: Except I wish I was there.

(Laughter)

MS. GOLD: The advertisement for the Florida Tourism Bureau comes up.

MR. LEONARD: Yes, bright moment. And that's the industry's interest.

MS. GOLD: Yes. They can --

MR. LEONARD: Making sure they get that, or they're just making sure you know you're about to go into whiteout conditions. So I think this is a very important start.

And so, you know, again, your advice on how do we build this framework, how do we engage other partners? Because there's no way we're going to have the resources to build federated systems on our own. We don't have the resources still. Most all the data could be involved. And we are never going to get all of the players who have critical information to disclose the information that's coming out of their systems.

MS. GOLD: And I can give you a national example, but I want to open up to --

MEMBER KISSINGER: Yes. Great presentation and a great project. I'm just curious. In the spirit of that, what sort of reaction are you're getting from your colleagues throughout the agencies and departments?

MS. GOLD: Intrigue. But some folks are, some folks when -- this has actually happened, came up to me and said, yes! Which is usually my purview. Some people are just, they're fired up. They know that there's a

platform for change and want to pick up some of these nitty-gritty challenges.

Some folks recognize the enormity of the kind of paradigm shift and have trouble looking at where it starts. And I think that that's the common theme. Certainly, for AVs last week as well, in a lot of these discussions is it's just so big, I don't know how to get started.

And that actually, I would say, is if there's any common theme I try to slip it in here, in other conversations, iterative, get started everything small, coalitions are willing, start something, and while you do, do it in a way that is replicable, ostensible, feedback loops, that kind of thing.

I know that sounds over-simplified, but just that shift which is not how we traditionally approach problems, I think, the folks that that resonates with are the folks that are probably going to be in our coalition and willing to get started.

MR. LEONARD: But to Peter's question, I want to put something out there as well.

MS. GOLD: Yes, you can say more than I can about it for people who are actually --

MR. LEONARD: And it's a larger ITS JPO issue, which is that, sometimes when we pose some of these things,

we get a mixed reaction inside the Department. We'll get a, now wait a minute, what is that going to do to our data program over in our agency here, or, why are you doing that, right? You know, why isn't the chief data officer doing that? And in fact, we're working hand-in-hand.

MS. GOLD: I have some scars.

MR. LEONARD: And, yes, and so I wanted to recognize that and, again, express my appreciation for --

MS. GOLD: Thank you.

MR. LEONARD: -- continually walking into the buzz saw. And so, you know, this is first time we're briefing you on this. But this is not the first time we've briefed this in the program, and I have to say, or inside the Department, the first couple of times we did not get a very warm reception. And that's true only because it's automation, and it's --

(Simultaneous speaking.)

MR. LEONARD: So I don't want you to think that everybody looks at this and goes, wow, that's going to be simple. Why didn't we start doing that? It'll be done by the end of the year, right. So these things don't always get a welcome reaction.

Some of that is, wait a minute, are you wearing your highways hat or are you wearing your Department hat, and are you going to put a new requirement on us? You

don't want to pay the bill for storing on this and you're going to impose it on us.

Some of it is very practical questions, and some of it are turkey questions. And some of it is the, sow, this is a good idea. How can we work together? I'm doing a similar data project. How can I combine with yours and leverage it? So the response runs the gamut.

PARTICIPANT: So are we still all supposed to call you the Data Czar?

MS. GOLD: Oh, yes.

MR. LEONARD: No.

MEMBER DENARO: A couple of comments. First of all, what you said, Ken, about, you know, maybe you're getting different kinds of data from different cities, or projects, or whatever, to me that's a good example of a good role for the federal branch of this.

And that is that, hopefully, first of all, it'll wind up happening, but then, hopefully, finding a way that that converges on the time to where you do get some harmonization, and standardization, and so forth.

It's a tricky balance there, because that can collapse into everybody having different data, and none of it works together, and so forth, and then you don't normally constrain it. But, I mean, looking at the rich list that's coming from these different organizations, that's a good

model.

And the second thing is you were mentioning, and again, one example, we don't know where the bike routes are. To me, that's a perfect example of why you share data. Someone's going to come tell you we can look at six parameters in your database, and we've figured out where the bike racks are, then correlating some stuff.

And that's only one. There's a thousand different things that if the data gets out there, people are going to discover it and come back and tell you.

MS. GOLD: Yes. Well so --

(Simultaneous speaking.)

MS. GOLD: I was biking right around the corner a few weeks ago, and a third party provider on my phone told me to go a certain way that was the fastest, by like, 15 minutes. So I go there, and it turns out they were putting me basically on the highway, like, one of the parkways.

And I said how bad could it be? They wouldn't send me here if it -- I come back, oh, my God, I am lucky to be alive. And then when I went to go give feedback, there was no way to give feedback on the bike routes. Because that was not government-furnished data, right.

So the app providers who we're probably rightfully outsourcing that user interface to, want to have

a close relationship with the infrastructure owner/operators. That's why you see this happening a lot.

And the easier we can make that, the less friction we can have that be. And less friction is from having harmonized data feeds where they don't have to have a custom development for every new place they go, right.

So are you all familiar with this GTFS example, General Transit Feed Specification? So do I have time to give, like, a two-minute story? I think it really, really helps. Yes.

So one of the tools we need to have in our toolbox is to have GTFS, which I'm going to explain in a sec, be really easy to do. So back, like, ten years ago, a Googler in their 20 percent time went to Portland TriMet, the transit agency, and said, I want to try putting transit data in Google Maps.

And the data are there exported. There's, like, ten-column CSV files, like, here's my data. And said, oh, can you change those two things. Come over some time -- but can you change those two things? And said, Okay. Okay, can you export it every 15 minutes? Okay, cool.

Suddenly, Google Maps has transit data. Different transit agencies started hearing about this and said, ooh, if I export my data in a CSV file in 15 minutes,

will you put it into your product? Yes. Citizens happy.

Now, enough people do it that folks come in and say, hey, is that Google? Like, is Google Map charges for it? They said, no, we don't care.

And so Google Transit Feed Specification became known as General Transit Feed Specification. And now, over 50 percent of the transit agencies in the country export their data in this harmonized, predictable structure. And every -- pretty much every city that you go into, you can get transit data.

So that's for ten years, great. Can we do that for these different federated sources in three months? So more of the -- the chief data officer of the Department saying, hey, let's leave it. This is the month support zone data. Let's get ten cities or ten states to all agree to harmonize around a common schema of work zone data, get some of the, you know, products people at the table to validate that the structure is sound.

Then USDOT comes in with SWAT teams and technical assistance to develop those interfaces to your terrible legacy systems. You agree they're terrible?

PARTICIPANT: Yes.

MS. GOLD: And so suddenly you have 10 or 20 harmonized feeds. And then the developers come in, put it in their product, enough of a market lead as the feds can

step back, and move on to the next one and then the 511s.

So these are some of the things that we're thinking about and hopefully moving forward on. We actually have people who have raised their hands to volunteer to be part of this. But those are some of the things, just like rethinking how the intractable problems, these little pieces, can be addressed.

MEMBER QUIGLEY: Did you just say work zone, because there was some construction work done.

MS. GOLD: Yes.

MEMBER QUIGLEY: Oh, excellent.

MS. GOLD: Yes. And one of the things AVs, we need to solve the current work zone data issue. Because this work zone data needed for AVs is so much more granular than what you need for humans. And we've got to solve it now for the current state. And we can --

MEMBER QUIGLEY: Amen. Oh, my God, I proselytize all the time, I evangelize about the curse of the orange cones. In fact, we have a cone-wide campaign out, we do. We started an ad campaign called Love the Cone, one, to promote, you know, the fact that cones mean jobs but also go ahead and give us feedback as well.

And when you see cone zones where there are no construction workers or, you know, let us know. Because that's the most egregious taking of capacity ever, is to

have a cone zone with no work going on for weeks, or months, at a time. You've just kind of stolen from the taxpayers something they've invested in. And it drives me nuts.

So I'm so -- and most of the time, I bring this up, and people will laugh at me saying, really, is that the biggest problem the city has? I think it's a huge problem. So I appreciate the fact you're putting that on the Board list for --

MS. GOLD: Yes. So sometimes, all you have to do is have a lot of conversations. And when you hear the same thing said a lot of times just say, oh, there's a lot of interest in that. Let's start there. So work zones, there's clearly --

MEMBER QUIGLEY: Yes.

MS. GOLD: It's a low-hanging fruit thing, and you can solve the problem while setting up a repeatable approach. And that's the framework thinking, right. So it's another tool we want to put in our toolbox. And it's mostly institutional, very low on the technical. Sorry, I had you all a few times --

MEMBER SCHROMSKY: No, I'm doing two things. I guess, what industry or data, as you mentioned before, some will be locked into -- I'm curious. What data do you want that you cannot get?

MR. LEONARD: One, I don't think we -- I think

what Ariel said, wouldn't it be nice if, say, an automated car manufacturer said this is all the data that's available off of that car.

Now, we don't think we need -- I don't think we need all that data but, I mean, ideally one of the things we want to look at is, okay, if everybody here has a different design for a vehicle, where are the commonalities? I mean, the things that, you know -- But you're not going to tell the guy next to you, and you're not going to tell the guy across the table, because you're all in competition with each other, and they're certainly not going to tell us.

So it now makes it hard to say, well, how do we create a unifying framework that has 80 percent of the information that everybody needs without getting that input from industry.

MS. GOLD: Yes. In fact, so I've been thinking about this a lot. Again, this is kind of one of the national use cases. You think where to start when it comes to automated systems, and safety is the thing that everybody gets aligned around, they just don't yet have enough, you know, the modes to understand what needs to be done there.

So if your question is how safe does the automated system have to be in order to operate like that,

that's your North Star. Then we're back to that. We need to know what the safety indicators are, as new technology. We can't just take safety indicators and scenarios from other technologies and apply it there.

That's where you need a bunch of up-front data from a very limited set in order to look at it and say, like, okay, we're going to say that that's what a near crash means. Near crash is going to be the safety indicator.

But this is the data mining algorithm I need in order to extract it from this raw data that comes from the AV. All right, that's one monster. Now I have my safety indicators. I know what I'm looking for, and I have the data mining techniques to do it on the fly.

Then you need to set benchmarks. Okay, well, to do that, I need to have enough longitudinal data from enough different OEMs in order to make it for a policy making or voluntary benchmarks, whatever. So that's Milestone 2.

Then I'm at the point where I can start sharing near real time data to validate whether that AV system that's on the road is safe enough to operate. Like, those are some gates, all of which include sharing different amounts of data for different purposes from a different community, right. So how do we get everybody to agree to

approach problems like that? I don't know.

MR. LEONARD: And how do we do it in advance? Because we know how we'll do it after all the AVs are deployed, and we start analyzing the pattern of the collisions that they're having. And it's, like, well this vehicle has a tendency to hit that vehicle, and someone will realize that there's a problem in -- there's an incompatibility in the way the algorithms deal with self-driving, right.

And so we'll say, okay. So there's a fix there that two companies now have to work on. But the goal through automation isn't to get -- instead of keeping you from rear-ending the car in front of you, to be the one that gets rear-ended from behind simply because you're algorithm works great, but it doesn't, you know, in the roadway system.

So I don't think we can fully identify all the data we need at this time. And I don't think the industry's finished designing all the data they need to make cars they can operate on the road yet, at least at the most advanced levels that, I think, people hold out there as the holy grail.

We know we have driver assistance, and it works fairly well. But what is it going to look like when we're trying and get to the 50 percent Level 5 automation?

MS. GOLD: And I set it up so we have societal exempt, so I think that's like...

MEMBER DENARO: So here's a suggestion. As one of the executive organizers of AVs, why don't you guys sponsor a breakout session at AVs 18 and start bringing a forum for data sharing, data requirements, asking just the questions you're asking of the kind of people who are there? What data do you have? What data do you want? How should we harmonize this?

You could get both practitioners as well as state-level, city-level, and federal-level all participating in this, and start the discussion, create it. I think this is screaming for some kind of forum. But I don't know that that's the ultimate one and, you know, wherever it needs to go, but it's a place to start.

MEMBER QUIGLEY: What's AVs?

MEMBER DENARO: Automated vehicles, San Francisco Conference --

MS. GOLD: You know, it'd be great if we could get it to happen in less than a year, right?

MEMBER DENARO: Yes.

MS. GOLD: Because there is actually, like I said, almost every breakout session was talking about data sharing. And we have talked about doing virtual forums in addition to virtual listening sessions, so if you all have

that plan, how to do that effectively.

MEMBER DENARO: A listening session might be a good way to start it. I've been kind of advocating for the last couple of years to have some focus on data. And I haven't gotten traction with my colleagues. But maybe with you guys, you know, who are very soon owning a lot of data, maybe that's the place to start.

MR. LEONARD: Well, it --

MS. GOLD: We may or may not be owning data.

(Simultaneous speaking.)

MR. LEONARD: I think it's a great idea, Bob. And, you know, Kevin Dopart, who's our national lead, is also involved in AVs.

MEMBER DENARO: Oh, yes.

MR. LEONARD: And so we'll talk to him about it. And you should talk to him about it.

MS. GOLD: And Nat will be here tomorrow.

MR. LEONARD: Nat will be here tomorrow.

MEMBER DENARO: Yes.

MR. LEONARD: You know, we did have people, I mentioned, out at AVs, including our data expert who was having conversations offline to talk about data sharing possibilities. So, I mean, I agree with Ariel that wouldn't it be nice if we didn't have to wait 11 and a half months.

MEMBER DENARO: Sure.

MR. LEONARD: But certainly, maybe we could make enough progress that, even 11 and a half months from now, we can share enough information --

MEMBER DENARO: Right.

MR. LEONARD: -- saying, well, let's have a forum so that we can start getting people off the dime to share the information.

MEMBER DENARO: I've been very frustrated by the lack of vision of my colleagues in not realizing the importance and potential of this to -- and I'm trying to find a sponsor, you know, who gets it also and can provide some focus.

MR. LEONARD: Sometimes there's a first actor problem too.

MEMBER DENARO: Oh, sure.

MR. LEONARD: And probably, you know, there's other things. But --

MEMBER BERG: A lot of the Government or DOD object.

MR. LEONARD: Yes.

MEMBER BERG: Do you have the point person --

MR. LEONARD: Yes.

MEMBER KISSINGER: Are you familiar with what Utah did in the Planning Department about UPLAN?

MS. GOLD: No, I'm not familiar with that particular --

MEMBER KISSINGER: Because you might want to contact some people out there. Because they have, essentially, a similar problem. They had their commissioner said, I'd like for all of the departments to be able to work off a common database. And they probably had 50 contractors that had 50 different systems at work.

And basically, what they did was pretty simple sounding. They called everybody up and said we want for you to work together. We want you to fully collaborate, or you won't be doing business with us tomorrow.

MS. GOLD: Yes.

MEMBER KISSINGER: And they did it.

MS. GOLD: Great.

MEMBER KISSINGER: And, you know, they have the dashboard that has, like, 70 layers of data in it.

MS. GOLD: Yes.

MEMBER KISSINGER: And, you know, safety is a topic, environmental, and capital planning, and --

(Simultaneous speaking.)

MEMBER KISSINGER: -- about 17 DOTs, I think, in the country.

MS. GOLD: That's great. Yes, so UPLAN?

MEMBER KISSINGER: You can Google UPLAN and go and get their presentation.

MEMBER SCHROMSKY: Yes. To that point, I mean, I'm looking at the diagram right there. That's a case in point. As you mentioned -- everyone knows we're connected. I will tell you, from a city standpoint, fire does not see police. Police doesn't do massive transit, even though they're all connected.

And then if he or she goes in there they cannot see all their assets in real time. So you've got the hard parts connected. We've had it for years, even in infrastructure. But that's one of the biggest issues that we see.

Memphis has done a pretty good job through a UASI grant, which is Urban Area Security Initiative, from a Homeland Security place, from a national defense standpoint, that if biological, or a terrorist event, whatever it may be, you can't -- it's still common today. Everything's connected, so a lot of issues that we have, we talk about connectivity, it's already connected. There's already GPS, I know where all the assets are. But the systems do not --

MS. GOLD: Yes. And this is how we built IT systems, and for a variety of reasons. And that's why, well, it's not said on the slide. Cyber security is a huge

part of this. What we're seeing is that the approach to cyber security is not to connect to the Internet.

And that's just you, right, like, I'm just not -- I'm just going to not pick, right? So this vision of smart cities, smart transportation, interconnected systems, system assistance, does not work if we don't put cyber security advice on, privacy advice on, into it.

And this is where some kind of fundamental information technology, like IT modernization type issues which, you know, you've got, really, General Electric and other, like, hundred-something year-old companies that are making big moves and showing you can do this in really large organizations and some government agencies.

But it's really hard. And it takes, again, like, the Mayor calling up, or the DOT guy calling up and putting things into contracts, and as I said, training your teams that are overseeing the contracts to know how to, you know, actually get folks to work together.

MEMBER SCHROMSKY: We're experiencing it right now. We have a large base on the mobility side. And with our infotainment, entertainment, you know, how do you monetize that? How do you do privacy, and opt in, or opt out? And changing the mindset of large business model, we're dealing with this first-hand right now. And it's difficult.

MS. GOLD: Yes.

MR. LEONARD: And this is a cornerstone of where we're headed with smart cities in that, you know, we want transportation to be a good citizen when it's working with public safety, sanitation, CDC, all of the other components that are going to be saying, hey, transportation's critical to the problem I'm trying to solve.

So we've got to kind of align our asset, which is going to be the transportation data that those other smart attributes in cities and communities are going to need. So this has really led us doing the organizational work for transportation and ITS.

And then we can work with -- we can bring that as an asset to the communities that are saying, okay, I've got to tie that into my energies. I'm going to use that in my -- tie that into my evacuation plan or my emergency contingency plans. Or just how do I deal with unusual events that happen in the city. Transportation affects so many things. This is core feedstock into the future of an intelligent operational community.

MEMBER SCHROMSKY: Like Atlanta and --

MR. LEONARD: Right. Well, you know, I mean, but then how do you deal with it? And how do you use data. I mean, Atlanta was phenomenal from a highways perspective to rebuild a bridge segment in 85 days.

And I was just talking to some people about another similar collapse that happened elsewhere with a little less notoriety. It took them five months to replace that.

So 85, you know, less than three months versus that, the cost of losing a bridge segment on a major interstate like that is abnormal. It's millions, and millions, and millions of dollars an hour, you know. It's a big number.

MEMBER SHAHEEN: So I really think that this is very forward-thinking and strategic. So I commend you guys for doing this. And I think -- I just had some notes of some things I wanted to share.

So I really like the idea of starting with these pilots where you've got to collect the data, you have a ton of data coming in and almost starting fresh as opposed to trying to deal with something legacy-based. And you've got all of these investments. What was it, $50 million last year in investments or more, that were made by DOT in pilots, something like that? Is that right?

MR. LEONARD: It's probably not over -- the JPO put in the pilots last year.

MEMBER SHAHEEN: Yes. I remember. I thought you had used that statistically to, like, to put $50 million of data associated with these pilots or -- you get what I

mean, right?

MS. GOLD: Yes.

MEMBER SHAHEEN: The $50 million leveraging that into a data platform, I think, is an exceptionally strategic thing. Now, with respect to the outreach that's needed, I don't think you guys need to do this alone at all.

And my comment is responding to your remark about being a first mover. So I've been involved with -- TRB has a transformational technologies executive committee that's been meeting and looking at how does TRB start deal with all of these disruptions, all these things that we're talking about, right, and how we manage data. How do we work with partners?

And Ariel and I were invited to attend a meeting, an ancillary meeting, on Monday last week at the AVs symposium, a pre-meeting. And it's looking at preparing for automated vehicles insured by one of these services. And it's the National Academy's TRB Forums.

And essentially, what they wanted to do was create a forum that can help us start preparing for both AVs insuring, given the level of disruption that we anticipate from both.

And I know, Ariel, you were involved in a breakout associated with data consideration. So it seems

to me that we don't need to wait a full year with AVs, perhaps reaching out to Mark Norman and to Neil Pedersen, about what you guys are doing. They may want to jump on this for their January meeting.

MR. LEONARD: It's a great idea. And you may not realize we are a sponsor of that forum.

MEMBER SHAHEEN: Oh, you are already. Okay.

MS. GOLD: Well, but via Kevin. So to be honest, I wasn't actually invited. I invited myself on that.

(Laughter.)

MEMBER SHAHEEN: But you have that clarification.

MS. GOLD: No, no, I know.

(Simultaneous speaking.)

MS. GOLD: No, no, no, no, no. But there's a lot, look, there's a lot of different events where data is now being included as a topic which, again, having worked with data in my title for a while, it wasn't always that way. Like, it makes me happy. But we need to identify the forums where folks are ready to get in the foxhole and start doing some stuff.

MEMBER SHAHEEN: Right. Well, so it sounds like --

(Simultaneous speaking.)

MS. GOLD: -- ready to start doing stuff.

MEMBER SHAHEEN: Actually, it's all around this particular idea of a forum. And what's interesting is, you know, two of the big topics we talked about today, right, are ADCD and sharing, right. So this particular forum is going to try to deal with all of these issues, including how are we going get the data, let alone store the data, and then disseminate the data.

MEMBER DENARO: That's a great suggestion. And I'm pretty sure that Mark Norman would be very interested in this. Because I've talked to him about it even before as well.

The other opportunity is, I don't know if you had a paper behind this, Ariel, but papers are due for the annual meeting in 12 days if you've got one ready to go. We could get this in.

There's, you know, three committees, one on ITS, one on vehicle highway validation, and then I run a joint-subcommittee on road vehicle validation. We could use those forums also to kick this off, because it's reasonably formal.

And by the way, the attendance in those meetings is really 120 people in those meetings at the end of the meeting. So that's another opportunity for kicking this off.

And, you know, maybe we need a whole different approach to start getting people to realize how important data is in the role that the government can play, both local and Federal governments can play in that.

MS. GOLD: And then we'll have a lot of demo data coming in near real time for Wyoming, right?

PARTICIPANT: Sure.

MS. GOLD: It's already happening. All right. I think we're out of time, or four minutes over.

CHAIR WILKERSON: Thank you, have a --

MS. GOLD: No, that's great.

CHAIR WILKERSON: This is good, you've got people going.

MS. GOLD: But this is really exciting. Again, this is the first time that we've been through the data collection stuff. And you all still really wanted to get your minds kind of going.

And now you're going to see the interconnectedness and all of the different opportunities. And you'll know what a day in my brain looks like. And it's really about -- I know what they look like.

The codes, and the drilling, and who do you think would be interested in starting to do some things, iterative approach, and also we're just sort of the low hanging fruit opportunities.

Because we're going to get aligned around some of the big picture, biggest priorities the Secretary has expressed on, right. So there's kind of a playing field that we know about. But where can we get started, I think, is probably the bigger question.

CHAIR WILKERSON: All right. Thank you.

PARTICIPANT: I don't think I've ever seen anyone so excited.

(Applause.)

CHAIR WILKERSON: Okay. So it's 1:50. We're going to take a break and that means --

(Off-microphone comments.)

MS. GOLD: Well, data has, like, a negative connotation.

CHAIR WILKERSON: Thank you so much, Ariel.

MS. GOLD: Thank you.

CHAIR WILKERSON: Thank you for your time. I think, based on the schedule, we'll take a break. And then we'll start up with Scott McCormick for technology.

(Whereupon, the above-entitled matter went off the record at 1:51 p.m. and resumed at 2:19 p.m.)

CHAIR WILKERSON: Well, Scott, why don't we go ahead and get started while Bryan --

MEMBER McCORMICK: Okay.

CHAIR WILKERSON: Tina join us. So I think,

based on the last meeting -- well, several meetings past, we have a chart. Do you have the -- oh, I think we had a chart of the subcommittees.

PARTICIPANT: Yes.

CHAIR WILKERSON: And the subcommittees compiled some -- they conducted meetings, some of them, and prepared some documentation for consideration. And I think the chart is coming up. There it is. One of the things we did agree to from -- and I have an extra copy, if you guys look through it -- was that that middle -- the second section where we talk about past review. I think we all agree that we would take that into consideration on all the other subcommittees.

MEMBER McCORMICK: Right.

CHAIR WILKERSON: Right? So technically there's four, but each four of those would then look at the -- what does that say up there? I can't remember. Try and look at the --

PARTICIPANT: Oh, here is the printed version if you'd like.

CHAIR WILKERSON: I have it printed here. It looks like -- I'll just let you look at the screen. It's the review of ITS program accomplishments. And so we said that each of the other four categories -- we're going to take a look at the various ITS programs that relate to

those topics. So that leaves us with four -- time to work today and tomorrow to discuss these topics. Scott is going to be -- I think today is your last day, right?

MEMBER McCORMICK: Yes.

CHAIR WILKERSON: Okay. And then we have two others joining us tomorrow. And so it would be great to have you give your views on technology and active transportation. And then we can figure out the last few minutes of the day to talk about how we want to use the time tomorrow and next steps. Is that okay?

PARTICIPANT: Yes.

MEMBER McCORMICK: Pop up the chart that you had previously. So we had -- we had Susan and Joe and Debra and Scott Belcher here on this group. The only thing that we hadn't written the subject because I wanted to get here and incorporate the things we talked about, but we said that the administration's position was to increase those four areas -- education resources, all forms of mobility, all general aspects of smart infrastructure improvements.

We had agreed previously that the subcommittee should recommend that the direct program office make the case for V2X and all forms of mobility to educate the Office of the Secretary on V2X's capabilities to support broad number of initiatives and provide additional coordination

of outreach for institutions, researchers, suppliers and standards organizations; to recommend Fuller Grants for studies on mobility; to encourage more public-private partnerships; to identify and publish best practices and lessons learned from test beds and deployments and solicit input from AASHTO, ITE and ITS America and others.

And Regina Hopper is leaving ITS America and they have an acting person there in charge now. I did reach out to both ITE and AASHTO, and AASHTO kind of deferred us to the pilot programs and said that would be where the information would go anyway. Peter has provided input that said true, we don't talk about safety anywhere, and I think we -- that was a valid point. I mean, even though it's an embedded in things like make the case for V2X, et cetera, et cetera, but it should separate -- it should be a separate line item as well.

And he also noted that we should talk about the V2I since we are talking about smart infrastructure improvements, which we'd all agreed on. I think from the conversations we had today we have aspects on all forms of mobility from the ATTRI to MOD, and with the work being done on the three pilots for Wyoming, Tampa and -- and New York that all have aspects that reinforce this space, that I think would be useful to refer to in the recommendations that we make.

Now, historically we do not write treatises on these recommendations. They are, you know, a page -- or a page-and-a-half long at least. What I wanted to do during this session was talk about what of those elements we talked about today or any others that you think ought to be included in this. What I will then do is -- is prep the -- the recommendation and submit that to the subcommittee for word-smithing, -- and then -- were we going to have a telecon or something in the fall to bring us all back together?

CHAIR WILKERSON: At some point we really -- we've said we would have another meeting. I have to look at the --

MEMBER McCORMICK: Okay.

CHAIR WILKERSON: The summary for what -- I thought it was October.

MEMBER McCORMICK: That's what I was thinking, too. So we had an October --

(Simultaneous speaking.)

MEMBER McCORMICK: Okay. Because then, if we can get that all done and circulated and then sent to you guys ahead of time for any additional word-smithing, then it is one of those, okay we're good with this to go, with the input we have.

So with that, what I wanted to do was to ask

about -- I kind of wish Tia was here, but you know, we did talk earlier about all of the different characters and requirements, all the different mobility for basically everyone in the digital divide. It's getting larger divide and -- and less capability. And from the conversations I have had with places like the city of Detroit and others, you know, the whole “car-centricity” is kind of not helping any of the problems that they have. And we really should be addressing that since we are talking about all the intermodal aspects, all the parts of mobility because I think Roger's group also covers the whole car side, you know, aspect. And we don't really need to do any overlap there.

With that, I will solicit any input.

CHAIR WILKERSON: So, and this includes the active transportation, right? Are there -- I know I had technology and active transportation. Was it -- Debra, were you the one who was pushing -- someone was recommending that we focus a little bit more on active transportation, or --

PARTICIPANT: Right, we were.

CHAIR WILKERSON: Was that incorporated in --

(Simultaneous speaking.)

MEMBER BERG: What do you mean by that?

MEMBER JOHNSON: -- use your legs to get from

one place to another. And it could be walking, you could be riding a bike.

MEMBER BERG: Got it, got it.

(Simultaneous speaking.)

MEMBER McCORMICK: We didn't put that word back in there, but when we had those, we kind of --

MEMBER JOHNSON: Okay, I just wanted to make sure -- I was just looking at the topics that we had --

(Simultaneous speaking.)

MEMBER McCORMICK: It's going to have the same issues that Roger just mentioned, is that what that transportation is --

CHAIR WILKERSON: Okay. Just trying to think if there was anything else.

MEMBER McCORMICK: Yes, and we talked about all of these items promoting frequencies allocations, role of ITS, funding deployment incentives -- all that stuff we addressed in our last meeting that you kind of took off the table and replaced them -- with this since then.

CHAIR WILKERSON: What about the data topics that we've had today? How does -- are there issues that we should --

MEMBER JOHNSON: Well you know what is interesting about this? This is the dilemma because there's an overlay with all of this. When we heard --

CHAIR WILKERSON: Yes.

MEMBER JOHNSON: Earlier, you know, that's -- -- mobility -- when we talk about all of that, when we heard about the acronym ATRIC?

CHAIR WILKERSON: ATTRI.

MEMBER JOHNSON: ATTRI, right. So all of this is encompassing, though.

MEMBER McCORMICK: Yes, I think data actually becomes a cross-cutting into all of these programs. And the issue is do you -- do you touch on it in each one of the subcommittees? Or do we just address it in an overarching document?

MEMBER JOHNSON: That's what I am thinking, too. As opposed to like the subcommittees, because --

MEMBER McCORMICK: Well, I think we just plagiarize some of Ariel's slides --

(Laughter.)

(Simultaneous speaking.)

MS. GOLD: Recommend back to the JPO that you do everything that I said.

(Laughter.)

MS. GOLD: That's off the record.

MEMBER McCORMICK: Not that we attribute it -- go ahead.

MEMBER BERG: Isn't it important for people

that -- for the subcommittee to understand how -- the role that data plays? Because it is easy to just say that's for everybody, but how does it manifest itself in -- for these intended outcomes? Or how can it be used?

MEMBER McCORMICK: Well --

(Simultaneous speaking.)

MEMBER BERG: From underneath?

MEMBER McCORMICK: We can certainly incorporate -- if we address each one of these, we can explain how the role of data -- in, a one or two sentences -- affects V2X for mobility and educating the office and et cetera, et cetera. And if we all do that, then it becomes -- then it is cross-cutting information across all of it. But we have to kind of all do it -- I mean, all the committees do it, if that makes sense.

CHAIR WILKERSON: Can I -- I'll play devil's advocate here?

MEMBER McCORMICK: Please.

CHAIR WILKERSON: What about the negative impacts of data? The harm that data -- and not just cyber, just --

PARTICIPANT: Privacy?

CHAIR WILKERSON: Privacy from the standpoint of, you know, not my device -- not in my device, but ownership we talk a little bit about. Sort of owning of

that data on the ability to relinquish certain rights. Getting -- we talked about getting compensated for use of your data, the total opposite of what the model has been for years. Just saying, what are those vulnerabilities and those disruptors?

(Simultaneous speaking.)

MEMBER McCORMICK: Well, an appropriate question is, what would be the recommendation we would make to the JPO with regards to that?

CHAIR WILKERSON: Yes, yes.

MEMBER McCORMICK: And they've already done that. We already did that in the last years -- the thing where we sat down and said we recommend that you make some -- in fact, we even said there's -- there's -- the -- twenty four regulations that address privacy, all of them are very specific to -- to HIPAA or financial transactions or whatever. They all basically plagiarize the really good one that was written in the beginning. They're all non-mandatory and they all recommend industry oversight.

And the question we had was then well, which is the industry that would provide oversights? Is it the automotive industry? Is it the -- the carriers?

PARTICIPANT: Third party.

MEMBER McCORMICK: You know, it -- there's multiple owners here, and any time you communicate data,

you create another level of ownership for the entirety of security. And so the question then becomes -- that you really will never -- because a lot of the types and form of economics the country operates in, we will never have a comprehensive digital data privacy law. Because if -- if you can know my credit card number, my social security number and if you do something to your benefit and my detriment, we already have laws in place to do that -- to handle that.

And the question then becomes is that why would we have some kind of data requirement -- privacy, ownership, security -- that's device specific? And in my -- my data, if we're going to make it private, should be private across all forms of media.

MEMBER SCHROMSKY: So, I think the question -- the answer to your question, one of the issues with data is trying to see this profile.

MEMBER SHAHEEN: Yes.

MEMBER SCHROMSKY: So for instance, if you are walking into a retail location and I scanned your license plates and took your facial recognition -- and I found out that you don't have a job, your credit history is terrible, I am not going to waste my time with you, because I only have a moment to actually --

MEMBER SHAHEEN: Or pick you up.

MEMBER SCHROMSKY: Or pick you up, or -- so that's some of the things, right? If you are building --

MEMBER SHAHEEN: Artificial intelligence.

MEMBER SCHROMSKY: If you are a business and you -- you're looking to get a franchise, then it's a challenge -- it's a challenge that you have.

I think some of the issues that you see in regulation of the data, there's a lot of challenges with the big data, and that's the creditors. Lot of -- not a lot of, you know, oversight and very valuable data. Yes, so --

MEMBER McCORMICK: A couple years ago everybody became aware that all NSA had to do was ask a telecom and it got all the data it needed. So, you know, I mean --

MEMBER SCHROMSKY: Well, I would argue against that, but that's okay. That's a regulated -- just like automotive, these are high -- I think one of the challenges we always run onto, even on this committee -- and it's always fascinating. We talk about automotive, we talk about telecom, these are, like it or not, heavily regulated industries, right?

MEMBER McCORMICK: Right.

MEMBER SCHROMSKY: I think what's happening is, if you look at taxi/limo companies, they're not very, you know, fond of Uber and Lyft -- if you've bought a taxi

medallion because there's huge disruptors that are -- you know, there's an avenue and there's a moment that they are going to circumvent the system, right? If there's money to be had, and you know, quasi-regulated, I am going to take advantage of that as long as I possibly can.

MEMBER McCORMICK: Well, but the point -- and that was sort of the hinge-point of the internet was when years ago -- I mean, you know, I've been on the internet since '76 -- or using the internet for protocols since '76. In '94 when it was made available for the public to use, right, you had for a number of years -- you could go to the web pages, even the primitive ones, and there would be ads for Hello, Dolly! and shotguns.

And they've evolved that to the point that I am looking to buy a camera lens as a gift for somebody, and within the day, ads for that exact lens from different vendors show up on the page and within a day after I purchase it, amazingly, those ads stop showing up. And so what they've done is they've said let's personalize what this is so that my harvesting of information from you is not seen as onerous but is seen as beneficial to you.

So -- and because the question is, if you aren't doing harmful or non-beneficial harvesting of my information, people stop using it for the most part. The problem is that we don't know. And Debra and I were just

talking about what happens on some apps on your phone.

When you -- when you give permission on your phone for an app to read your SMS messages or look at your photos or any of those things, those maintain their separate programs. And when you delete that app, those separate programs are still there because you have not withdrawn permission for them to use that. Okay?

And so when we look at the question of -- of data privacy, data ownership, it shouldn't be that I am worried about what my car and my infrastructure has, it should be well, what is the principle that we are looking for this to accomplish. And everything that has gone on in D.C. -- the privacy advocacy group which I took three months to find out was entirely funded by Microsoft -- the Intelligent Vehicle Coalition, which was entirely funded by AT&T, Verizon -- you know, they have an agenda by where they want to go and what they want to accomplish.

And the problem is really what do we bring to the party when we want to make a recommendation for what we want the JPO to do on this? I think the issue of data ownership and privacy is well beyond the scope of the Department of Transportation. I think it is a much broader, much more important issue that if we want to weigh in on it should be as generic as saying data shouldn't be -- what the people have all adopted -- it says we are going

to have you opt in for the use of our data.

I have some problems with that. Because I only have met maybe one person in 100,000 that actually ever turned down, you know, an -- loading an app because of what it said it was going to harvest. You just kind of found here, you know. You're not, you know?

CHAIR WILKERSON: But I think -- well, I am just -- I am opening the door to some of this time, just because it is all --

MEMBER McCORMICK: The question is where do we add value and direction?

CHAIR WILKERSON: Yes.

MEMBER McCORMICK: That's always the question is at what point are we going to tell Ken and company something that is actionable by him and within his chart. And I'm not -- and we've had this conversation before with Ken, that you know, that is going to be governed by larger issues.

CHAIR WILKERSON: And also safety. There's a component of safety. Are there protocols for use? You know is it a given that all this technology will be accepted? Or do we have a responsibility?

You know, I think about what we -- one of the things we were doing was, you know, we found out that a large -- the number-one killer of teenagers was car -- car

crashes, right? I didn't know -- you know, two years ago I didn't know that. And we found that part of that was due to tire maintenance because none of the driver -- only a handful of driver's manuals told people how to check your tire pressure and tread depth.

So we just this past week got 50 -- all 50 states to include in their driver's manual tire pressure and tread depth. Two-and-a-half years earlier, then, the 20-20, is there some protocol for safety or helping people be good stewards of the technology that is inherent within the -- just like helmet use or what have -- I am just --

MEMBER McCORMICK: That's a compounding -- that's a compounding problem because when you look at the idea of platooning, you know -- we did this. We took somebody that was all into platooning up to a track in northern Michigan and had two identical semis, had identical trailers, unloaded, go out on the road and brake at a certain point. And one of them stopped 100 feet while the other -- purely because of the tread depth on the tires.

And so when I asked Kurt, when I said there's no law for platooning, five of you says well you're going to have -- the cars are going to have to communicate what their stopping distance is. And I said, but that's not a fixed number. If I have a load -- if I'm on rainy traction, that has to be an algorithm that's calculated and so they're

now going to be this much farther or shorter. And he says we don't know how to do that yet.

(Simultaneous speaking.)

MEMBER McCORMICK: -- or take the guy with the longest stopping distance and --

CHAIR WILKERSON: But each car is not equal, right? Or it doesn't have gas or what have you.

MEMBER McCORMICK: But back to the question on the whole -- on the whole aspect of data, I think there are lines that we can add to almost every one of these that have to do with encouraging the sharing, the visibility, the anonymity, the security of data to advance each one of these spaces. But I do not see anything that we are going to recommend to the Joint Program Office to do it. I am opening this to say tell me if you think there's something we should be asking them to look into and consider.

MEMBER KISSINGER: Well, I guess I am just a tad confused because I thought the context of this particular sort of subcommittee and recommendations were the whole idea that the administration has already committed to this magical $3 trillion in infrastructure, and yet no one quite knows what that is. And the committee wanted to weigh in to make sure the -- the infrastructure needs that we thought were unique were at least put before the Secretary to make sure that --

(Simultaneous speaking.)

MEMBER McCORMICK: -- is that we want to make sure that they understand that the V2X technologies were part of the solution for improving infrastructure, not competitive with it. So you are right, you are absolutely right. And that's kind of the intent we were going to go with this is to say let me make sure you understand that these are things that can help you meet your goals -- your infrastructure spending goals -- and are added to the solution. They're not -- they're not taking away from somebody else's bottom line. They are providing --

(Simultaneous speaking.)

MEMBER KISSINGER: -- wanted to say something today, I just came up with a separate recommendation.

MEMBER SHAHEEN: Or it be more clear about what we are saying.

MEMBER McCORMICK: Yes, I think --

MEMBER SHAHEEN: Because I am not sure that is clearly articulated here yet.

MEMBER McCORMICK: Right, and I think your comment earlier about the use and the pervasiveness and the availability of data is an important thing to put in here.

MEMBER SHAHEEN: Well because that enables technology, right?

MEMBER McCORMICK: Well, --

MEMBER SHAHEEN: I mean, technology enables the data which --

MEMBER McCORMICK: It gives you an additional tool for which to derive new knowledge and understanding.

MEMBER SHAHEEN: For infrastructure management, right?

MEMBER McCORMICK: Yes. And it might also work for the stuff Roger is working on is something he can mention. Or not.

MEMBER SHAHEEN: So what's the end product look like? I always have to think about -- so, October we are going to have a draft --

PARTICIPANT: Of recommendations. An advisory note.

MEMBER SHAHEEN: And then January we go final, right?

PARTICIPANT: Correct.

(Simultaneous speaking.)

MEMBER SHAHEEN: So what does the report look like this -- this time?

MEMBER McCORMICK: We can send you the last one.

MEMBER SHAHEEN: No, I -- I participated in it. But just because the last time -- I was not able to participate in the spring -- but the last time I was here I remember we talked about trying to come up with I think

a format that maybe was more actionable or I think more helpful. And I don't know, did we make any progress on that? Does -- so -- so are we going to kind of do the same exact template that we did last time? Because I remember what that looked like.

MEMBER McCORMICK: I think -- from my recollection, the discussion that we had is that it shouldn't be as long as it was. And it shouldn't be --

(Simultaneous speaking.)

MEMBER McCORMICK: Right, there wasn't 16 different topic areas that we were responding to. In this case there is four and there will be a larger answer to each four.

MEMBER SHAHEEN: Okay.

MEMBER McCORMICK: And we were going to try to present it as here were your goals, or here were your objectives, here's where we think these different subcommittees weigh in on where that's --

MEMBER SHAHEEN: Okay.

MEMBER McCORMICK: The one thing I would like to ask Ariel is your thoughts on this particular subcommittee with the things we just talked about with respect to data itself.

MS. GOLD: The only thing I will say is that when we assume that data is a part of everything it becomes

a part of nothing just because the paradigm shift hasn't happened yet. So -- yes, if you all can come to a consensus on some recommendation, it might seem self-evident, but having, you know, your collective voice weighing in and highlighting and formalizing something is always welcome.

MEMBER McCORMICK: Okay. So, okay, we will be champion of the audience.

PARTICIPANT: Well and the other thing is that --

MEMBER SHAHEEN: Well I think to reinforce that you'd like to --

(Simultaneous speaking.)

MEMBER McCORMICK: Yes.

MEMBER KISSINGER: This is going to the Secretary, it's not just going to JPO.

PARTICIPANT: No, that's right. It is. It's going to Congress.

(Simultaneous speaking.)

MEMBER KISSINGER: - - say, all right the rest of DOC, get in line with and what JPO is doing with respect to data.

MEMBER McCORMICK: Yes, that's important.

MEMBER SHAHEEN: I mean that seems to be where we're going, right? With at least a big part of today's discussion.

MEMBER McCORMICK: Yes.

MEMBER SHAHEEN: Because we like the idea of pilots. We like the idea of public-private partnerships that help us get access to data. And we like the idea of a life cycle to data management process.

MEMBER McCORMICK: Well actually, I am not a fan of pilots. We have been doing pilots for 15 --

MEMBER SHAHEEN: How are you going to get the data, though?

MEMBER McCORMICK: Because you use -- build reference platforms. And the big difference is that a pilot tends to go away and get rusted away when it's done because nobody continues using it. Reference platforms says I am putting in something that you can buy now, that you can use now, that you can maintain and use. That's one of the things we're doing in Detroit is take -- they don't want to put in a pilot.

They want to put in something -- they're going to spend money, but they don't have a lot of it. They have $6 million and want to spend it, they want to have something that's live and useful and robust. They're willing go into new things -- they have a lighting system that will communicate with the outside world. And I didn't even know that. Right?

MEMBER SHAHEEN: But there's no certainty in -

- I mean you have to have --

MEMBER McCORMICK: There's no certainty in anything in life.

MEMBER SHAHEEN: No, I understand that. And that's why it seems like pilots are beneficial.

MEMBER McCORMICK: Pilots are beneficial because it's a -- it takes and allows a funding vehicle to advance areas of interest where there's -- where there's an obvious need. Every one of the pilots that you guys talked about, they are addressing very specific problems that they have. They've done write-ups, they've got weather issues, they've got -- the old people in Florida.

Whatever the problem is, right? They've got all the traffic issues in New York. They're addressing very specific problems. And so those become more than demonstrable proof of concepts if they're maintained and kept and used continually. We've got tremendous amount of architecture that we put in for the 2005 San Francisco ITS World Congress that literally just rusted away starting day-one after the congress ended.

MEMBER SHAHEEN: Right.

MR. LEONARD: Scott, can I ask you a question? How do you feel about an implementation, a demonstration, a pilot that fits? Because --

(Simultaneous speaking.)

MR. LEONARD: If the notion is that we're not going to go out into the real world with something that's going to stay in place. It assumes that we have nailed it down, so it's -- it's not really in a research stage at that point. It's --

MEMBER McCORMICK: Failure is only defined if you provide no continuity to resolve the issue you discover. If you say I'm going to give you $30 million and you haven't got a robust plan that does an evaluation of how we're going, where we're going, is it -- what's successful, what's not successful -- one of the big issues that you have with grants is that you have this catastrophic failure mechanism that occurs when people go all the way to the cliff, they realize the cliff's there and they stop. Right?

Because they haven't developed a robust plan to go forward. I spent a long time of my career -- for 25 years of my career, you know -- General Electric developing for future programs, right? Hundreds of billion dollars' worth of programs and there were glorious failures in that.

But the failure taught us something. It was test points that we created to say well, okay, how do we know if this is going to work? And do we have multiple ways of achieving our objective that we can now execute on number two or number three. When finished, we had that

number technically, rest in peace. You know you sat down and said look, we have a huge problem with -- that because we got these -- these political entities, we've got universities, we've got industries, we've got other agencies and all who want us to do certain things and maintain it.

The Department of Energy -- they were spending $100 billion a year on hydrogen research. They said okay, after 10 years they said we're done. We've learned everything we need to learn. Right now they're working on commercializing. But the political and the industrial and the academic community pressured them to continue spending that money for two more years.

So you know, there is -- there is a way that you look at the job and the project that says am I just going to go down this path assuming that I am going to be successful and not have the ability to execute some other way, not having a checkpoint, a litmus test to see am I -- am I approaching this successfully? Am I getting to do this?

I mean, ask anybody that works in business. Right? Ask Roger. They don't go to develop a product to put in the -- a company without knowing what all the risk factors are, what are all of the things they're going to execute, and knowing when to kill it a bill. Knowing when

to kill a program -- if you've got $20 million allocated to something and $5 million in it should be killed, you don't have a good mechanism to kill it.

CHAIR WILKERSON: I don't know if that answered your question.

MS. GOLD: I think it might be good to point out that the connected vehicle pilots we purposefully call them deployment pilots, and all three of the sites plan on continuing to operate anything that works.

MEMBER McCORMICK: Yes.

MS. GOLD: So it could be a way of further defining what you all mean by pilots. Because the CV pilots are different than safety pilots.

MR. LEONARD: They are specifically put in that part of the planning was we thought it was a proven technology for these pilots.

PARTICIPANT: Yes.

MR. LEONARD: It's also why, in the ATCMTD grant it's -- which are deployment grants -- it's a viable technology for that. We're not funding, you know, cold fusion experiments in transportation.

(Laughter.)

MR. LEONARD: We did fund, you know, going back 15 years, magnetic nails in the highway, and nobody is saying well, we did that pilot and let's go install

magnetic nails in the highway for -- for connected vehicle communications. So --

PARTICIPANT: But that goes with proofs of concept.

(Simultaneous speaking.)

MR. LEONARD: So that's what I am trying to get at is to what extent is it appropriate -- and I'm really asking this to the Advisory Committee -- to what extent is it appropriate for us to go out in the real world, as opposed to do something on paper or do something in the laboratory, where we are what I would call piloting, prototyping, you know a -- and we're going to do it with real people in the real world to determine the viability -- does the technology do what it says it will? Does it work at scale? Can we gather enough data to determine that there's a business case that we might want this technology to result in a deployment and allow states the locality and stability?

MEMBER McCORMICK: And I think that's an important piece of nomenclature that we have to establish. You have pure research that has to occur to get us to that point. You have demonstrable proof of concepts to see it if it works. You have pilots to gather, you know, the scalability determination at the Ann Arbor test lab to determine, you know, does the -- the DSRC spectrum can

handle a large number of users.

And then you have the deployments. And my point is that bulk of this work that we've done up till now has brought us to where we need to do deployments. I think the amount of pure R&D that has to be done should shift to autonomous or should shift to our maintained system. Because other than how good is this -- is 5G going to be compared to DSRC, that's going to be determined basically by -- by companies like his and the Chinese, right?

And so the question is, do we need to be doing a lot of pure research? Well, we always need to be doing some. Do we need to be doing a lot of pilots? Probably no, there's not a whole lot more that we need to pilot in this phase that hasn't been evaluated at some level through the VIIC, through Ann Arbor, through the California, through all the other pilots that have gone out in the world.

Deployment is our most important thing. And the employments should be those things that help -- evidence what the beneficial aspect of this is, whether it's an economical aspect, it's a safety aspect, you know, it should be the thing that allows others to say I now can understand the value composition because it's been deployed, you know, in this location. And I've got cold

weather, I've got wet weather, I've got New York weather, I've got all of these things that can now -- you can make relevant to your situation.

Following the openings of 511, Oklahoma -- or, Arizona went off and developed their 511. Oklahoma decided it was going to do it. It didn't use anything they developed, they went out and replicated the work all by themselves, right? There wasn't any other carry-through of that. And that's part of what AASHTO is trying to do is bring all of these players today with their directory that says let's put a list out of what is everywhere and what you -- and where are you.

That's the purpose of the affiliated test bed is to get people the information that says hey, we've already looked at cellular V2X. Here's the specs, here's what we did, here's what was useful. You know, go ahead and borrow that. Go ahead and use that. You know, you've got out there code that people can use.

We've never been to that place before. We've never been to a place where I can go to a government site and say hey, I want to use your -- I want to use that data. Oh, look, and here's the code that I can use to bring it down and massage it and manipulate it or incorporate it in my stuff. That's a huge change.

Industry is not aware of that. Your beltway

companies are aware of it. The people that are working on your programs with you are aware of it. But it's not broadly understood in the industry. And that's -- when I ask you the question, you want me to send this out worldwide, the answer's not yet. At the point we do --

PARTICIPANT: Give me a month -- just a month.

MEMBER McCORMICK: Okay. At the point we do send this out, that's where it becomes overwhelming then for you because you're going to have all these people asking well, where's this? What's this? I need this part of it too. Do I have to develop this?

You know, that becomes -- but what's happening is that people are using it. Right? So my view on this is that we address those things that we identified that they want to increase infrastructure spending in this area. That we make the case for all of these that are valuable. And then the question comes out of these is that of these, we are not going to have some recommendations for you other than to say that you should provide eventual coordination of these institutions, la, la, la, la. You're on that path now. Okay? But how many different sites did you show us where there's data? Six or seven?

MS. GOLD: We're getting there.

MEMBER McCORMICK: Yes. How many sites can I go to where it's just one page that tells me here's the

list of all the data?

MS. GOLD: So this -- so that's where I would just, you know, encourage you to look at the second-to-last bullet point there. You probably see that and know that in order to identify best practices and lessons learned, you need to have data to have empirical analysis. Most people who see that thinks there's a report that they can read and that's it.

So that's the only thing I would encourage you to think about if what you just outlined is what you recommend, I doubt the folks reading that bullet point will have the takeaway that you want them to have as it is currently written. That's the only thing that I would just encourage you to think about what should be explicit.

MEMBER McCORMICK: I went earlier this year and all the test beds in China so I could write up, you know, the long report that says here is -- based on the connected vehicle reference in the location architecture who has the capability to do what. I can't do that with any program you have. Other than that one slide you showed today, that's the only place they've ever said that they can link it to the CBR. But it was obvious that they all based it on that.

I should be able to go to any city's test bed or California or Michigan's test bed and find what

capabilities do I have. I mean, I am actually creating a survey to do that and mail it out to everybody and say please go fill this out, right? So that we know. Because if I am in Oklahoma and I want to do a test, I need to know what I have in a region that I can use. Right? Could be that I am a city, could be that I am a first responder. Is that the responsibility of the entire program office? To put together that matrix that says here's the test beds and here's what they have. I'm going to suggest we recommend that because no one else has the ownership of those.

(Simultaneous speaking.)

(Laughter.)

MEMBER KISSINGER: This, well, I mean, if so, I think it belongs under a separate topic. I mean, data -- the data subject, I mean, you know, this whole thing started -- the most recent conversations, Scott, well we respect sort of because you said I don't like the word pilot, or I don't like piloting.

MEMBER McCORMICK: Right.

MEMBER KISSINGER: And I am not even sure we have a common definition of piloting around --

PARTICIPANT: That's true.

MEMBER McCORMICK: Yes.

PARTICIPANT: That's true.

MEMBER KISSINGER: You know, I mean and part of what I heard you seem to be saying is you say you want to maybe take issue with the allocation of resources along this continuum of research de-emphasizing pilots, emphasizing deployments -- I don't know that there's an issue there, but if there is we can certainly talk about it and decide if, you know -- if the committee wants to say anything --

MEMBER McCORMICK: Well let me ask the question, when -- when a bill gets approved, what percentage of that goes to research? You've got $100 million out of how much? And that's for all JPO activities, right?

PARTICIPANT: Right, and --

MEMBER McCORMICK: The real question of that is research.

MR. LEONARD: It's a difficult question to answer. All of it is R&D dollars.

MEMBER McCORMICK: Okay.

MR. LEONARD: In terms of the different budgets.

MEMBER McCORMICK: Right.

MR. LEONARD: You know, a capital improvement budget versus an R&D budget versus an operations budget. So all of our JPO dollars are R&D dollars, okay? They come

from that appropriation.

Now if you're saying how much of that goes towards --

MEMBER McCORMICK: Well what is a deployment classified as? Is that classified as --

MR. LEONARD: Those are paid for out of R&D dollars. Our statutory authority allows us to do pilots and deployments out of our -- that R&D budget that we get. So -- so you're asking -- that's why I say It's a hard question to answer because there's a budget definition. The budget definition is that all of the money we get are R&D dollars.

Now what you're saying is how much of that is for research and how much of that is actually putting equipment in the field? And then how much of that -- putting the equipment in field -- is going to stay there on a permanent basis?

MEMBER McCORMICK: Correct.

MR. LEONARD: So it would depend in part on how you would, for example, define the Ann Arbor model deployment model. Was that research? Was that, you know, a demonstration pilot? Or was that a deployment?

At the time it was viewed as really proof of concept research to support the necessary decision to go into the decision, move forward with the rule making. It

was conceivable to everybody, but --

MEMBER McCORMICK: That was at deployment because --

(Simultaneous speaking.)

MR. LEONARD: -- it was research and looking back at it at 2017 it was really initial deployment money in a lot of ways. Although none of that technology is at 2017 standards. So none of those boxes would really exist in the real world today.

MEMBER McCORMICK: And maybe -- maybe, and it's true, we don't really have the knowledge to recommend that more should be going toward deployment. I think maybe what the statement is, we should ensure that money is spent on the pure research on pilots and on deployments as a continuum of moving this work -- this body of work into usability in the real world. Maybe that's what the recommendation is.

MR. LEONARD: And I would be careful with terms like pure research, because --

MEMBER McCORMICK: Right.

MR. LEONARD: In a government turn from 6-1, you know, to 6-7 research we don't do, you know -- you might consider pure research 6-1 through 6-4 or 6-5. We really don't do -- that's DARPA. That's Bell Labs. That's that level of foundational research. And we don't really

do that.

MEMBER SHAHEEN: You do deployment research, right?

MR. LEONARD: We do things at a higher technology maturity level, 6-5, 6-6.

MEMBER McCORMICK: Excellent point. Because it's a higher technology --

(Simultaneous speaking.)

MEMBER KISSINGER: I mean, no one has ever suggested like Michigan has to give back the hardware that it's paid for, right? So I mean, the issue that he's raising really isn't an issue except maybe for the level effort. And we want to put more emphasis in that kind of research.

(Simultaneous speaking.)

(Laughter.)

MR. LEONARD: We don't have a place to put the equipment if any -- or they wanted to give it back to us and it's --

MEMBER McCORMICK: Well I mean, it's like I said, the -- when there are two gentleman that are assigned by Ann Arbor to figure out how to monetize the -- the capability that they have. How to make sure it doesn't rust in place.

MEMBER KISSINGER: I mean part of me hears Scott

saying, something like we recommend that wherever possible that, you know, deployment should place priority on ensuring that we adequately consider what the end process is and the implications and to the extent feasible, but you know -- but I think you do that already.

(Simultaneous speaking.)

MEMBER McCORMICK: Yes.

CHAIR WILKERSON: Steve, you have the floor.

MEMBER ALBERT: In the presentation we heard earlier today about all the different pilot projects that are going on, most of those were fairly small in terms of probes -- they seemed to me. And I am wondering if one of the things that maybe needs to be discussed is -- in our recommendation is that you've done a lot of these pilot-type projects, maybe it's something to do -- maybe we should be trying something on a mega scale versus a very small scale in terms of probes and asking for much more money that really then looks like a big pilot.

MR. LEONARD: You mean a recommendation --

(Simultaneous speaking.)

MR. LEONARD: By number of probes, you mean say 10,000 devices?

MEMBER ALBERT: Yes, like you know, 8,000 in New York City or 500 in Wyoming, or -- whatever the numbers were. They were fairly small.

MR. LEONARD: Well, except that -- I mean, I want to -- you say fairly small, I look at those pilots represent $42 million of our budget.

MEMBER ALBERT: Yes, no, I --

MR. LEONARD: Columbus.

MEMBER ALBERT: I'm just saying just share -- just share numbers.

MR. LEONARD: No, and -- I mean I think you would have to -- it's a legitimate question. You have to think about what you would want to achieve if you said we are going to put out 150,000 devices.

MEMBER McCORMICK: Well we already -- the organization with three or four years ago. We sat down, this whole -- we had presentations --

MR. LEONARD: Well, just -- you have to think about in the world of finite resources what would that do? We've talked in the past in this forum about the research we've not done, things we -- the AFRA program, which everybody loved hearing about, is a program we reduced two years ago when we had to accelerate the pilots and move forward with Smart Cities, and move forward with ATCMTD.

I've heard people talk about the importance of cyber security. You know, there are a number of ITS areas that I think are important that, if we said we are going to put $100 million -- or we're going to put one whole

year's budget into nothing but deployment, what would happen to all that research we stopped and what would it cost us to restart? So I mean I understand --

MEMBER ALBERT: I hear you, I am just thinking like a, you know, typical man, bigger is better.

MEMBER McCORMICK: But my point is that three or four years ago we made that recommendation and they agreed.

PARTICIPANT: Yes.

MEMBER McCORMICK: We had a presentation where we said look, if you would require V2I and V2X -- or V2V and V2I for interstate commercial vehicle, which is the only class of vehicle that the DOT can -- can legislate, can put a rulemaking out without vetting it with the states, is that you would get an immediate -- because it also applies to all vehicles for interstate commerce, not just new ones.

So if you had that requirement, several things happen. One, you'll have a plethora of new devices and devices out there within a year it will all be -- you know, it will all be crowd ranked in terms of which ones are garbage and which ones are good. It would also require V2I. It also reduces to almost nothing the amount of infrastructure you need.

So I take the example, Michigan you put a tower

at the Toledo crossing, a tower up at the -- at the Indiana border and a couple at the international borders and because the signal can hop vehicle to vehicle, the state can collect traffic data all day long for free. There's no business model impact.

And so in doing so it doesn't cost you anything other than rule making activity. And the -- you guys came back and said you fully agree. And it's never happened. Without a path, and it stopped kind of half-way. But that would put a 100,000 or more vehicles with equipment on the road. We made the -- I made the suggestion that said we're buying 300,000 new postal vehicles that travel every road in the country six days a week and I read the spec and there's no requirement for V2V or V2I out there, and that would have been a simple solution.

PARTICIPANT: It would have.

MEMBER McCORMICK: I know.

MEMBER SCHROMSKY: So let me -- let me ask this question. Ken, you mentioned something on cyber-security and Bob you mentioned something earlier before DSRC and Cyber. I know a couple committees ago we really hoped to add cyber security at the SMSC. And as you mentioned some funding, new administration, new goals -- right? Cyber is on the top. I'm looking and saying let's go back a couple of these and say, you know what, even though funding was

cut $3 million where it may be, it is now more than ever encouraged that funding or research be conducted in these areas because -- you know, it's one of those things we come up with a recommendation then we move on to a new recommendation--

I think in some cases, because I heard a lot of cyber and different technologies. There was some good work back there that I think we might want to dust off and --

MEMBER McCORMICK: V2X it --

MEMBER SCHROMSKY: One of the things that -- I look at this is there's no common criteria to some extent. Right? In terms of credentials, especially if you -- because we're already jumping from the tangible vehicles, physical, to somewhat intangible and ones and zeros in a physical sense, right? But there is common criteria. I am going to have cyber security sharing information, it's not between database and exchange. It's also from vehicle to infrastructure, V2V. Right?

You're still not a common criteria. And with recent cyber attacks, right? With IOT and DHS is already doing this and also is -- NIST is heavily involved in this. And I will tell you from GSA, first time ever, for their fleet and everything else, they're starting to look at FISMA, they're starting to look at fed grants, they're starting to look at where this stuff is stored. This is

never happened that when we made these recommendations three years ago, I think -- I think we have to really -- especially with technology, I think, you know, as you mentioned three -- the number is three, right? That was three years ago? Three minutes? Thirty minutes?

I think we should maybe look at one of those. That's one thing I didn't see in there to say hey, this funding was cut. There's examples that -- you've got to double down. There might have been shortcoming, but I -- and not having cyber security, because if you're looking for funding, let me tell you something right now. You put cyber in front of your thing and I'll tell you right now, you're getting funding. You're getting funding.

MR. LEONARD: And I didn't mean to suggest that we didn't know --

MEMBER SCHROMSKY: No, I know -- I know what you're saying.

MR. LEONARD: Because we -- we focused on the SCMS portion --

MEMBER SCHROMSKY: Yes.

MR. LEONARD: To support the rule making, and so, you know --

MEMBER SCHROMSKY: Right, yes.

MR. LEONARD: But we -- but we had to cut out $3 million worth of other cyber security research that we

think is important to ITS generally.

MEMBER SHAHEEN: So I am not sure how we are recording feedback, but I --

MR. LEONARD: Verbatim.

MEMBER SHAHEEN: Feedback? Okay. So my thinking is, if the focus here is supporting technology in the context of infrastructure investment, that -- I have to put my glasses on here, that we should support all the recommendations with a “why” and, to degree that we can, have that supported with facts from JPO. So if we want -- make the case for any of these things, I think we should be collecting information that would support the why that we think either this should continue or we should revisit this or we should augment this.

Because I feel like the bullets in their current state, which was one reason I asked, what is the format of this thing? If I were the Secretary or any external audience -- not be a part of this conversation -- I would not understand this and I would not probably pay much attention to these recommendations. So I think we really do have to say why.

I will say that based on today's briefing I think the discussion of -- the recommend for the grants for studies on mobility, right? I think, you know, what I am hearing is that the pilots are valuable. So I will

counter you. And that I think more needs to go into the evaluation. So I would love to know what that number actually is of what percent the funds go to the evaluation piece in contrast to the deployment piece, right? So is that 15 percent?

Because I think now that we have entered into an era of big data and big unmanageable, untenable data. The evaluations are getting really pressed. I will speak to that as a researcher. Our jobs have gotten so much harder because of the amount of data and the problem of data acquisition, let alone storage and management.

So I think that we should really talk about, I think, the role of the evaluation piece. You know that discussion that I brought up earlier in context of the CV pilots of causality, right? Really getting that causality is essential to understanding the value of CV in the context of safety. But without really solid evaluation frameworks we cannot get at that.

MEMBER McCORMICK: So is that the recommendation? Is that we're going to recommend to JPO is that they --

MEMBER SHAHEEN: I'm giving recommendations right now.

MEMBER McCORMICK: Oh, okay. Sorry.

MEMBER SHAHEEN: That's what I'm here to do.

MEMBER McCORMICK: No, no. I was just making sure that's what we're doing.

MEMBER SHAHEEN: I think we need to add a bullet about more focus on data management to specifically accompany the R&D of ITS JPO including the pilots. Because I, as you probably heard from Bob Sheehan's comments. I am part of the evaluation team that is funded out of JPO on the mob sandbox. That evaluation is woefully funded when I -- when I bid it with Booz Allen Hamilton I knew it, but I wanted it that bad that I took it on. Right? Because I wanted the opportunity to do that work.

But the resources just simply aren't there to take on the scale of 11 pilots simultaneously with so many different performance metrics and the fact that I have to negotiate data. And Ariel and Bob know that a lot of what I am doing here is negotiating data. I am not designing a survey to get data. I am negotiating to get access to data.

The survey stuff -- the IRB stuff, that's a piece of cake now. So I think these are really important things. The bullet about encouraging more public-private partnerships, I think we have to leverage these private sector partnerships. I think it is more than just encouraging. We have to take information from JPO about how much money is going into those pilots, about how much money is being leveraged from those pilots. If I were the

Secretary I would want to know why am I funding research and how is the private sector engaging in this given the focus of this administration?

So I think we really need to -- to focus on that particular bullet. I see a missing bullet which is --

CHAIR WILKERSON: Can I ask you a -- was that from a feasibility standpoint? From the leveraging?

MEMBER SHAHEEN: I just would like to know how much are we leveraging private sector resources and dollars and on - - on the investment of the USDOT, right? So if Columbus is now $250 million, that would be a very important thing I think for us to present and to talk about. And this is a common theme. This has come out in several of the meetings where I have attended where I think Ken has really elegantly presented the opportunity of something like a smart city to provide us with the opportunity to really quell those pressures and restrictive dollars.

The additional comment I would make that is something missing here, again thinking about this new administration, what are the impacts on labor on GDP of this tech-based infrastructure focus? If we are making a case that we shouldn't just be focusing on real estate and pavement and traditional forms of infrastructure, I think we need to quantify that in ways that are meaningful to this administration.

MEMBER QUIGLEY: I do too.

MEMBER SHAHEEN: So --

MEMBER McCORMICK: Yes, that's an excellent --

MEMBER QUIGLEY: I do, I think that helps accelerate the effort and the message in terms of, you know, justifying the why.

MEMBER SHAHEEN: Right. So those are just -- you know, I don't -- I am not doing a full assessment of the recommendations. But these are just things that, based on today's meeting where we are all together, these are things that I think are actionable and -- and came out of a lot of the bullets that you already had, Scott, but there are a couple of bullets that I think are -- are absent. But I do think what we should try to do is work with JPO. When we answer the why as to why JPO should keep doing this, try to work with JPO to help us with the data that supports our arguments.

PARTICIPANT: That's an interesting statement.

MEMBER SHAHEEN: If that's possible.

MR. LEONARD: Just, if I could, just a couple -- you asked a couple questions in there that I think I have some answers for. Just -- you said do you -- what percentage of those --

MEMBER SHAHEEN: Yes.

MR. LEONARD: Into evaluation. And so I

mentioned that on the ATCMTD grants we have the opportunity to take down $2 million of $60 each year.

MEMBER SHAHEEN: Two million, oh that's right.

MR. LEONARD: So that -- that is about 3 percent. Now that is just one program. I am not by any means suggesting that we put 3-percent of all -- you know, not all projects have evaluations. Not, you know -- every $150,000 test doesn't have an evaluation. Some have independent evaluators. But I can't give you a total percentage. But I can use that ATCMTD data --

MEMBER SHAHEEN: That's helpful.

MR. LEONARD: As an example of a case. In terms of leveraging, ATCMTD requires 50-percent match from the states. A number of our grants either require 50-percent or -- or 20-percent match. So that's not that uncommon for us to leverage other people's money in that way. But you've heard me talk before about Columbus, how we put $40 million in. When the proposal came back, they were leveraging that with about an additional $90 to $100 million. The last public statement from Mayor Ginther in Columbus was that they felt that they have leveraged it to about $417 million in additional -- now that's a ten-to-one leveraging.

Now I am a little skeptical of a ten-to-one leveraging. You know, how much of that was things that

were already being planned versus how much did it --

MEMBER SHAHEEN: Double counting.

MR. LEONARD: Yes, yes. But I do know that that approach that we took was one that was intensive on bringing in public-private partnership. And ironically it is also on Columbus Smart City. We -- the Secretary waived the match. So people could have come in with zero dollars rather than requiring the typical 20 percent additional money. And people brought in more because of the excitement around that particular ITS area.

MEMBER SHAHEEN: See, I think we should be documenting these things that you are telling us in our report.

MR. LEONARD: And I do think, you know, to your point about public-private partnership, I think we need to continue to explore that because I do think that we're working in areas that bring such intense interest that people are willing to come in and bring additional resources to the table. But I also think we have to be very mindful of what they're bringing and if we are asking for the right things.

Sometimes we might be asking -- they might be brining money and what we really need them to bring is data. So we have to be mindful of what we're --

MS. GOLD: Just that -- yes, just a point of

fact, ATCMTD grants do not involve any requirements around data sharing. So while there is money called out for evaluation, that connection between ability to evaluate and need for data is not exactly there in that particular program. So again, food for that.

MEMBER SHAHEEN: We need to work on that.

(Laughter.)

(Simultaneous speaking.)

MEMBER McCORMICK: This isn't my input. This is input from our working group and from the input I received from the committee, which you're on, between that meeting and this meeting. And I think we have more to add. So I think between my notes, and if you can send me -- you know, just take a picture and send us those notes.

PARTICIPANT: Yes.

MEMBER McCORMICK: I am going to reach -- and I have got some information -- some suggestions from Peter that I have yet to include. I will compile that and intent was never to look at a PowerPoint, we always go with our notes.

PARTICIPANT: Right, right.

MEMBER McCORMICK: Is that we can start compiling that together, taking out the things that aren't relevant or that we do not want to include in this, include the things that we added today or that other people will

think of from that, and then we can write that up in between the committee and then socialize that and wordsmith it and tell us where we want it. So that's what we're going to be doing over the next couple months.

MEMBER SHAHEEN: Yes, you have done a great job. I am just -- I am always looking to the end product and -- and I --

MEMBER McCORMICK: Oh, I totally agree, yes.

MEMBER SHAHEEN: If this is going to be really compelling, right? To the Secretary and to Congress, I think we've got to back this up.

MEMBER McCORMICK: Right. No, I think that's a true and valid point. Take the numbers that if I can says okay maybe it wasn't $400 million, maybe it was $200 million -- but something just that is an exemplary product to move that forward. Yes.

CHAIR WILKERSON: Well, we can come up with a template that addresses that --

MEMBER SHAHEEN: The why and then the facts.

CHAIR WILKERSON: Rather than -- we've had the issues and then the recommendations, but we can sort of quantify and put some other factoids as simple as --

MEMBER SHAHEEN: Particularly the things that we want to continue or things that we want to revisit. Like cyber or --

CHAIR WILKERSON: Okay. Good points. Go ahead.

PARTICIPANT: One point. I am mainly in listen mode here, but I wanted to -- just to jump on the evaluation piece. The evaluation piece, I think, is key. So making sure that that's part of the discussion and tying it back to also the -- provide additional funding and outreach for institutions, researchers, supply and standards organizations. That was the basis of the CV pilots, not just to deploy something, but actually identify a need, provide the solution, evaluate the heck out of it, figure out exactly what we got out of that -- that effort, and then be able to package that in a format that we can really sell it to folks that this is an opportunity to do something.

And to Steve's point on getting bigger deployments, this was meant to sort of generate focus at looking at, “Hey, maybe I should deploy 20,000 vehicles in my area, and this is what would do for me.” So moving the CV pilots in that direction I think is key. And that data piece is, we've learned -- we've learned from the CV pilots that the data piece is essential to really conduct an evaluation. So I think that's something to keep in mind too as well. We have really learned a lot from the CV pilots, and that's a big part of it.

Also the technology diagnostic aspect of things -- we shouldn't lose that. Because I think as Bob mentioned this morning, it is really looking at how do we use like the ITS architecture which is really a technology -- a diagnostic base -- to help us with that interoperability piece that's also essential to getting this thing deployed, you know, on a national scale.

MEMBER McCORMICK: So, to close --

CHAIR WILKERSON: Hold on. I wanted to see if anyone else had comments regarding the points that Susan added. I know you comment --

MEMBER QUIGLEY: I just want to say ditto. I think she's smart.

(Laughter.)

PARTICIPANT: She is smart.

CHAIR WILKERSON: Joe you have any or --

MEMBER McKINNEY: Yes, I've got -- I can. This is a little bit out of my field, but I appreciate the work the subcommittee did and I loved the discussion that kind of add to some of those points I think are really important to do that.

MR. GEHMAN: Can you take a comment from the peanut gallery?

CHAIR WILKERSON: I assume so. I mean, I think we often ask.

MR. GEHMAN: Sure, okay. So I would -- I would expand on the sentence there.

MR. STERN: Sir, would you mind coming down a little closer to the microphone?

MR. GEHMAN: Sure.

MR. STERN: And state your name for the record, please?

MR. GEHMAN: Julian Gehman, and I would expand on what Susan said. You have to -- this is bottom-up and it's very good detail. You also have to think about, you know, what happens when this lands on the Secretary's desk? She's going to ask, you know, why should I go to the president with this?

And so you need to address jobs. And you need to address flyover states. You need to address his base. So how is this going to impact him politically? And that's how you get this sold.

CHAIR WILKERSON: We appreciate that.

MEMBER McCORMICK: Well actually I think that I want to make a similar point. This will be the first recommendation from the Advisory Committee that this Secretary reads.

PARTICIPANT: But they do a good job.

MEMBER McCORMICK: So I would -- my advice to you would be make a good first impression.

(Simultaneous speaking.)

PARTICIPANT: One thing I would say is I am going copy this to the Committee other than the subcommittee on this, so if you have any other input or feedback, please send that in.

MR. SMITH: Oh and Al Stern is going to make the presentations available for folks today. So you -- yes, you can freshen your minds.

CHAIR WILKERSON: That will be great, thank you.

PARTICIPANT: Super. Thank you for doing that.

MR. SMITH: We should be able to just email it out to folks.

CHAIR WILKERSON: I think most people have it already. I think it's just a matter of having hard copies. We have them all electronically.

MR. SMITH: Oh, no I don't --

(Simultaneous speaking.)

CHAIR WILKERSON: But -- are you talking about the documents from the --

(Simultaneous speaking.)

CHAIR WILKERSON: Oh, super, super. I thought you meant the committee presentations.

MR. SMITH: Oh, no, no. Not those.

CHAIR WILKERSON: Okay. All right, well if

there's no further comment I will transition to our --

MEMBER BERG: Sheryl, can I just --

CHAIR WILKERSON: Sure.

MEMBER BERG: I hate to do this, but since Scott's not going to be here tomorrow and one of the points he raised which is really independent from most everything we've talked about was this previous recommendation about putting a higher priority on commercial vehicles. And that's maybe more the labor portion than it is research.

(Simultaneous speaking.)

MEMBER McCORMICK: That's part of our legacy of one of the things that we recommended and one of the things we talked about was saying well, okay, if it was agreed to, was it implemented? And that's what I'm wondering whether it was, but yes. Every one of them -- everyone's unanimously supported on the Advisory Committee. JPO said yes, that's what they -- they agree with it. Secretary said thanks and started down that path. But then it kind of dissolved after some period of time.

So I don't -- I don't really know why it went away. But I think the question is -- the Committee ought to ask is if it's a still valid proposal. Still a valid recommendation. And reiterate that that's something you would still would like to see, you know, completed. Or at least worked on. Pursued.

MR. LEONARD: If you -- well --

MEMBER McCORMICK: And I don't know if there's others in the past that fall under the same category. We probably each ought to look at that as well.

MR. LEONARD: And I think you are specifically referring to a connected vehicle context here --

MEMBER McCORMICK: Yes.

MR. LEONARD: As opposed to -- in some way the answer I am going to give you is not as satisfying. I can tell you that as the Department is looking at automated vehicles, that commercial and motor vehicles are front and center. And FMCSA is fully engaged in that technology and its implications in a way that I've not seen FMCSA engaged before. So that is both encouraging and very positive news. They had a great conference in January. Brought in about 100 people were there, right?

And they're working truck platooning and across the breadth of FMCSA's senior leadership -- Daphne Jefferson and Jack Van Steenburg, Kelly Regal, Larry Minor -- they are all very much engaged in truck automation. So it doesn't address the specific issue in terms of connected vehicle progress. But it, you know, it's -- commercial vehicles are not forgotten in the Department.

MEMBER McCORMICK: And, you know, they have their work cut out for them because of the CIS 2010 is

going to have to be completed if they do come out for it. So --

(Simultaneous speaking.)

MEMBER BERG: Commercial vehicle product.

CHAIR WILKERSON: It's a great transition. Maybe we should start with that tomorrow.

MR. LEONARD: And the whole platooning discussions has a connectivity element in it. You can't do platooning without connectivity.

CHAIR WILKERSON: Okay, so here we've got five more minutes and tomorrow if you -- does everyone have a hard copy of the schedule? Do you have the schedule? The draft?

MR. STERN: The agenda?

CHAIR WILKERSON: Yes, the draft agenda. Sorry, I --

MR. STERN: I don't have paper copies today, but I will have them tomorrow.

CHAIR WILKERSON: Oh, no, no. That's fine.

PARTICIPANT: Oh, okay.

CHAIR WILKERSON: I said we can look at the time for this, people may not have it. Tomorrow we have one, two, three, four “to be determined.” We may have Nat sort of break that up, which is great.

Is -- my recommendation would be to start with

your section tomorrow which is -- hold on, where are you? Yes, so the connected -- the automation in relation to being connected, automated. So we'll do that first, if that's okay. And then maybe we will go to traffic safety. And then rural or rural and traffic. Which --

MEMBER McCORMICK: Rural crusader.

CHAIR WILKERSON: One of the concerns I had was that the schedule as drafted only has 45 minutes for one of those sections. If there's -- out of one of those groups, is there one that you think will take -- might take less time? Otherwise we can use the -- we will just revamp the -- the agenda tomorrow. Maybe not worry about it.

MEMBER KISSINGER: I can't imagine traffic and safety culture taking more than 15 minutes.

CHAIR WILKERSON: Okay, so why don't we do that as second and then rural last. And then I thought the last hour would be great for us to just sort of reflect and do next steps.

PARTICIPANT: Yes.

CHAIR WILKERSON: Figure out what our time line is. Maybe take a -- take a hard look at that -- what our template might look like so that we can each figure out, you know, if you're going to have graphics, data, quantifiable graphics to complement our report. And then start to put an outline together. I think that would be

helpful. And then the next --

MEMBER SHAHEEN: I think that will really help us use the time effectively.

CHAIR WILKERSON: Okay.

MEMBER SHAHEEN: In fact, you don't know, Sheryl, if you want to possibly consider doing that at the beginning as a discussion about that template, you know --

CHAIR WILKERSON: Well, I think it's kind of taking shape. I mean I have even --

MEMBER SHAHEEN: Well and even out of this discussion a little bit.

CHAIR WILKERSON: Yes.

MEMBER SHAHEEN: Because like when I -- when I look at just where we are here with this particular subcommittee, we need to -- we need to --

(Simultaneous speaking.)

MEMBER SHAHEEN: That discussion a little bit further around what's the end product.

CHAIR WILKERSON: Okay.

MEMBER SHAHEEN: So -- so I --

CHAIR WILKERSON: Why don't we spend the -- instead of my opening remarks, of which I will be summarizing this -- why don't we use that ten minutes to -- fifteen minutes to really start to think about that. And

if you want to kick that off you can.

MEMBER SHAHEEN: Sure, okay.

(Simultaneous speaking.)

CHAIR WILKERSON: Or you had a --

MEMBER SHAHEEN: Well, no, did you have another idea, or --

MEMBER JOHNSON: Well, no, no, no. I think that is fair because I found the discussions today to be quite helpful. And as we look at the subcommittees we have, I am drawn back to what we talked about before. I think it is imperative we understand what the end product is because there is a lot of overlap with these. And considering what we just heard from Julian and the audience is basically giving that, you know, 10,000-view perspective because we don't want to lose people.

And I think, considering what the current administration is focused on -- not that we should glob all of our things to attract their attention -- but basically be mindful of it as we develop this product because this could be a -- you know, an exercise in futility if we don't do that otherwise.

MEMBER SHAHEEN: Yes.

MEMBER JOHNSON: And so I think --

MEMBER SHAHEEN: Speak to our audience, right?

MEMBER JOHNSON: Right, and I'm thinking you

know, we may need more than 10 or 15 minutes because, you know, we talk about, you know, traffic safety culture and things like that. We have these discussions to help sort of frame our thought process around it, and I just think that perhaps after hearing this today we may be taking on more than we need to as we did before as opposed to focusing on some really great elements that then could be flushed out later on. But that's not for us to do. We are supposed to advise. And so that's why I was -- there's a little trepidation.

CHAIR WILKERSON: I have one recommendation -- we will take the coffee conversation and then we will go from 8:20 to 9:05. And then we will do 9:00 to 10:00, okay? With the traffic safety. And then I think that will give us a start and if we need to revisit that again we can take some more time or --

(Simultaneous speaking.)

MEMBER KISSINGER: The only point I would make is that the -- write up on traffic safety culture and the write up on road safety that Steve and I first collaborated with, I think both those on the -- two of those on the assumption that they were ready to go.

(Simultaneous speaking.)

MEMBER SHAHEEN: I was focused on the two subcommittees that I was on as opposed to --

(Simultaneous speaking.)

CHAIR WILKERSON: Well we can take a look at that and see how we might revamp it, or use it as our template or example.

MEMBER SHAHEEN: Yes.

(Simultaneous speaking.)

MEMBER KISSINGER: And if we had time for another TBD I would suggest adding this discussion about regulatory versus non-regulatory approaches.

(Simultaneous speaking.)

MEMBER KISSINGER: And kind of encourage --

CHAIR WILKERSON: You said your section will take 15 minutes. Maybe you can use the rest of your time.

MEMBER KISSINGER: There you go.

(Laughter.)

CHAIR WILKERSON: Is that okay?

MEMBER KISSINGER: Yes.

CHAIR WILKERSON: Okay.

(Simultaneous speaking.)

CHAIR WILKERSON: So it is pretty much the same except we will go through 8:20 to 9:00 for -- I'm not going to say all opening remarks, but it's reflections on administrative structure, template, things like that. And then the 9:00 to 10:00 -- it would be 9:00 to 10:00 for traffic safety culture. Great, that's an update.

Automation would then go next. And then for connected and automated vehicles, break, and then next steps.

MEMBER McCORMICK: We could work through lunch, too, if we need.

CHAIR WILKERSON: Yes, that's true. What a great idea. Okay. Is that fair? Yes. All right, well, we went over by one minute. So thank you for your comments, thank you for our speakers, thank you for coming in, we appreciate that. Thank you.

(Whereupon, the above-entitled matter went off the record at 3:32 p.m.)