Monday, April 8, 2019, TxSTIC Meeting Austin, TX

Welcome and Introductory Remarks

Darran Anderson, TxDOT Director Strategy and Innovation

We're very appreciative of the efforts of the Research Division and Federal Highways to continue this effort to team together to bring new research from across the Nation back to Texas, and to share that with business into helping us in this not only on the TxDOT part, but for state agencies as well as regional partners, is to make sure that you're aware of this research or these national efforts.

Al Alonzi - This is multimobile. If there are any ideas short or long term that impact other mobile of transportation. Thank you.

Rocio Perez – As Darren mentioned if you do have any problem statements that you want to bring to our attention please let us know, typically we have an open call around September and October time frame or you are welcome to reach out on our website, our division, or information on technical assistance.

Local Technical Assistance Program (LTAP) Report

Bryan Sims, The University of Texas at Arlington

Goals for TxLTAP: To reach all 254 counties and to provide technical assistance and training to those local governments, whether it be municipalities or county across the state.

The University of Texas at Arlington has had the program for almost 4 years.

We provide instructor led courses, technical assistance, we host a website that includes a mobile website, developed instructional curriculum, and produce quarterly newsletter.

We travel all over the state. We attend various conferences around the state speaking about TxLTAP, constantly on the phone, sending out information whether it be electronic or direct mail.

Special training events, these are some events that we helped over the last few years; Heavy Equipment for Wildfire, Heavy Equipment Rodeos, snow and ice control, gravel road, and a paper recycling Academy. A new event that we're working on the year.

In March, last month, we hosted the regional LTAPA meeting.

Q - Who all can apply for assistance?

A – Anyone and/or entity, that would be working for county government would potentially be able to obtain services from us.

Q – How is it funded; federal, state?

A - It is a mixture of both.

Comment - Innovation means something different to everyone. I know that there's a lot that you and your program can leverage at the local level, not just what's happening at the national level, which is learning from your counterparts as well from across the region from across the country. I know what it takes to do what you do, and I just want to thank you for it and hope that we can leverage a lot more of the Texas for what we're trying to do.

Q - How does somebody contact you to see your portfolio of different technologies that you have available for training?

A – Visit the website or give us a call.

James Kuhr – For clarity the funding is not coming from the county or city. The training is absorbed by TxDOT.

Bryan Sims – There is absolutely no cost for the counties or municipalities that ask for these resources that's funded through predominantly TxDOT.

Q - From parks and wildlife side would our local partners that collaborate districts have the ability to the resources?

A - I do not know the answer to that, but we can find out the answer.

EDC Project Updates

1. Weather Responsive Management Strategies – Ken Perrine, Center for Transportation Research

Weather responsive roadway management and divide the presentation into two parts, because we're an interesting transition phase right now. We did our EDC project, which was very exploratory in nature. And now we're positioning our EDC5 project, which is where the rubber hits the road.

The theme of the project was to look at how sensors and data could be used to enhance roadway operations. Among that there were some technical realizations that we had a lot of which had to do with how to make the project sustainable for new census data to TxDOT, and to really fit within the operational workflow you get the data and sensors needed to fit within the TxDOT workflow themselves. That includes; staying within the architecture, finding ways of making the data appear within Lonestar, other tools that are used within the traffic operation centers, and also being able to have the data that's produced by sensors, owned by TxDOT so that they can be used for analysis purposes. Also a major theme of the project was trying new technologies for dissemination.

This is where we've looked at studies probability, and different ways of diversifying sensing technologies so that that resiliency can be improved.

We also look at performance metrics ways of assessing data reliability, but also assessing how important is it to make future investments in new sensor technologies.

One important aspect of that is understanding vendor delivery time, so that we can always stay on schedule.

Early in the project, we engage in stakeholder meetings with stakeholders from local agencies that were involved with emergency response.

 Representatives from Texas districts could talk with representatives from the National Weather Service and the National Weather Service offers a number of really great resources, but the collaboration goes both ways. Not only TxDOT uses National Weather Service data, but the National Weather Service has a great desire to learn what the processes are within TxDOT so that they can understand how to tailor that data and how to inform TxDOT when they want severe weather events, and when severe weather events are coming.

Anticipate that we will be able to offer some very groundbreaking approaches for real way whether.

Q - How do you expect, at this point in time, to disseminate the information? Once you gather that in a real time manner so that it can be useful to the folks on the roadways?

A - The most pronounced events we can put into variable mentioned signing highway advisory radio media outlets. But we also want to look at technology packages so that when connected vehicles really become commonplace. How can we just be ready to deploy in that way. Along with that, there's a lot of crossover with mobile technologies. There are a variety of things to offer services for branding information systems for apps that can be installed within respective regions. We have already seen this with in some areas of TxDOT in Texas. So these are all areas that we wanted to see as viable outlets for disseminating information.

Q - If, for planning purposes, and we want to get the data, and help us developing our future. When will that be available?

A - I would say at this juncture, contact me. Because we are actively working with the tech staff districts and with our stakeholders, but also speaking with districts themselves as they become more familiar with this technology. Especially those that are engaged in these four stages of the EDC5 project, they would want to be able to connect you with the data sources. That is one area that we want to look at for opportunities for growing our data catalog after this, so our data catalog is freely available to anybody that walks in and goes to that website. That would also have contact information for the respective owners.

Q – What is a Data Catalog?

A - It's not actively maintained right now, that's definitely something that we can apply our lessons learned. It is a very good example of the vehicle that could be used to facilitate collaboration among different agencies.

Q - Are you coordinating with Waze or do you have a relationship with Waze because they're the dominant way finding app most people use, and when will this demonstration data be made available for them?

A - Within the project itself we have not been using Waze data, but I know that within TxDOT there initiative to use Waze data. What sorts of opportunities are there for being able to take various pieces of information, so that we can create future winter weather and program information system so they can appear with some traffic operation center, and disseminate into vehicles that we have.

Q – For Parks and Wildlife, we just launched our new reservation system where you can actually reserve their location, but would this be interactive to where it would be a two pronged destination that our guests can defer to this link, what level of sensing are going to do - down to major roadways or the county roads?

A - We focused on wherever there's interest. And it's a balance between cell phone communications availability for other types of wireless communications.

Q - I just had a question regarding the study that you're doing, is it focus just on whether or also severe storms approaching areas to notify folks that are on the road, so they can take shelter?

A - We focused on primarily floods. We anticipate that there's going to be a lot of crossover with other types of weather types. In fact, we have a task within that project, specifically, to apply what we've learned from winter when the platform to other types of weather phenomenon, and environmental conditions. So with that, there's going to be enough crossover that this project is relevant to other types of extreme events.

2. Advanced Geotechnical Methods – Jimmy Si, TxDOT

Focusing on - Goals of Geotechnical Subsurface Investigation

- Mitigate risks to project schedule, design, and budget.
- Improve reliability by optimizing geotechnical site characterization using proven, effective exploration methods and practices.
- Avoid or minimize uncertainties during construction in order to:
  - Save TIME, Assessing risk and variability in site characterization
  - Reduce COST, Maximizing return on investment in project delivery
  - Prevent FAILURES! Cost of failures is too high

Benefits of Geotechnical Subsurface Investigation

- Reduced Risk
  - Reducing uncertainties in subsurface conditions
  - Mitigating design and construction risks
- Improved Quality
  - Improving confidence in the geotechnical characterization
  - Reducing unnecessary conservatism in design

- Establishing a more reliable basis for design and construction of foundations and other geotechnical features impacting the highway system
- Accelerated Project Delivery
  - Significant number of construction delays can be attributed to inadequate knowledge of subsurface site conditions, well-scoped investigation programs improve decision-making and constructability, providing time and cost savings for transportation agencies

Q – Have you not been using seismic testing up until now?

A – Seismic testing has been around for many years. We haven't used it a lot. Those tests have limitations. The seismic test compared to others may need more engineering, judgment, data interpretation because the geophysical is backlogged.

Q – Is there specific locations?

A- Yes, we schedule up to five projects. I don't remember what location or state.

3. Automated Traffic Signal Performance Measures – Barbara Russel, TxDOT

Summarize to current challenges that we have back to traffic signals, explain the goals of the ATSPM project, update the status of the project and give you a little insight of the future.

TxDOT currently operates over 6200 signals from the States and only about 90% of these are connected to the TxDOT network. Many of these are in rural locations, and they're far from an existing TxDOT infrastructure.

One, how do you provide connectivity to the signal in a cost effective and secure way. One more left out of this first sentence is meaningful connectivity. We do have connectivity to send signals. But it's sort of antiquated. Two, How do we get the data back and analyze it? Three, which performance measures should we be collecting on our traffic signals? Which performance measures are going to give us the best data and give us the best analysis?

This answers the first question, how do we connect signals in a cost effective and secure way - two options that this project is going to look at, one proprietary option and the second is the internal option. The first is going to provide end to end, out of the box solutions. We're going to also similarly have someone over a VPN and there could be a lot of hidden costs that we're just not aware of right now.

How can we get the data back and analyze it? We are going to provide the proprietary option to provide the analytical tools to take the data from the signals and provide performance data.

It's going to provide direct data feed of the raw data. We'll share the data with our partners because it's going to be compiled in a similar manner, we will maintain ownership of the data and that's critical. The data will be sort of managed and overseen with our TxDOT policies. This internal option relies on software that was developed by the Utah Department of Transportation, which they shared with TxDOT for free.

We want to move away from having only 9% of our cycle's network to 75% of our single network in 5 to 10 years. That's a huge undertaking. That's our 4000 signals. So even if we go to 10 year round, that's over one signal per day. And it's expensive, but has a significant value. The network signals provide real-time monitoring and including reliability.

Q - Does the RFP focus on looking at 5 to 10 year horizon? Does it look at the plans by entities like Amazon and Google and SpaceX and others to deploy to many, many, many satellites and essentially provide broadband availability globally?

A - Currently, the plan is to use some logins over the VPN. So we're not going to do the satellite option. That's not something that we're looking at with this particular RFP.

Comment - But its broadband, their intent is to provide broadband globally. So it might be worth at least including some mention of it in the RFP so people are looking at technologies.

Q - What are the benefits and the terms of cost benefit changes? Have you looked into the benefits?

A - The cost benefit analysis would possibly be something that they're going to look at to address with an RFP. But typically, if we can manage signals more effectively and be proactive, it can save time with the repairs. Just a quick analogy of a car repair. If you do a car repair immediately rather than waiting, it's going to be a lot faster, cheaper, and it's going to move on rather than waiting till it impacts other systems.

Q – Are you considering sharing that data with auto manufactures for the signals to the vehicle?

A -It is going to be data owned by TxDOT.

Q – Is there a planned timeline for this project?

A - It's about a two year project. It's going to kick off on September 1 this year.

Q - So what's the timeline for all 4,000 regions?

A – That is the 5 to 10 year timeline to get this done. The goal is to try to get 100%.

Break

Texas Connected and Automated Vehicle Task Force Update
Darran Anderson

California, and then Michigan passed laws related to autonomous vehicles on roughly the same 2015 timeframe. California laws were very restrictive. It was very test focus and was very limited in scope on what you could or could not do, which was interesting because that's where all the innovations were happening. Both a traditional auto manufacturer, folks like Google, and others were trying to implement. What can you do in terms of mobility and accessibility for

people that can't drive? All of those are of value to us, but I think the real value in many ways to early manufacturers was, if I can free all these people up from driving and put an information system in front of them when they're driving, or when they're not driving, I just freed up how many hundreds of thousands of commuters every day to spend time on the internet in a vehicle as they're being transported to wherever you want to go. I can feed advertising to them. There was a big dollar figure that I think was in mind and I still think in the mind that they'll be able to reach so many more Americans and some people across the world. If they can free them from the task of driving and the basics of safety or I think in many ways safety is secondary to them, although I think that there's opportunities there and business opportunities for them that they see related to safety.

California was very restrictive. Michigan passed a very open law, really with the intent of allowing initial testing. I think that they have also gone the route of just opening the appointment now in very little restrictions, a collegial agreement with the traditional manufacturers up in Detroit. I think they had to do that because of the auto industry and the impacts of depression in Detroit that year. They had to do something to reignite development in the Detroit area and then likewise to you help your citizens.

Texas had an opportunity to see both in play. How are they spurring innovation? How are they being employed? What did it mean for the industry? Did it bring more industry to bring more people on employment to their areas? So in 2015 there was a bill, at least I believe was on the Senate side. It was much like the California bill, but it was much more restricting only testing. Very specific circumstances with all these commands, control mechanisms in place. I thought, well that's a shame, because we're never going to make it clear that we can do some kind of advancement for autonomous and also connected technologies. That's where it's going to be a long effort on my part to educate and talk about what we could or could not do, what we should be looking at for our state, and how it can benefit our people.

Surprisingly, then in the subsequent two years leading to last session completed in 2017, it was almost a complete role reversal in a number of people from across the industry. From across different safety advocacy, to some of our senators and some of our house members, about what we could possibly do and how can we bring these technologies to the state. The end result was Senate Bill 2205, which is a very open bill.

How do you employ that solution in a way that is favorable to not only your business, but also to the state and to the people wherever you want to use them?

Privacy. How do we use the information system in that vehicle and not let it be widely disseminated to everybody in Houston in nefarious ways?

Before we said we were going to have one in Texas, there were probably at least 50% of the other states that had already started one. We were watching it, the numbers were very small initially, and Michigan had the first one.

We haven't had our first meeting, we have not sent out the invites to people yet, but I fully intend to try and execute at least the first come together meeting before the end of May. I'd like to have

that done and some of the questions about just "what does it mean" answered before our leaders in the legislature depart for the summer.

We had discussions with the state of Michigan. We met with their leaders and asked him if they had some underlying questions they didn't see on the surface about how they put it together. Why did they pick the members they picked? We've been wrestling with who's the right people to invite, so that we have the right expertise, but at the same time we don't offend a bunch of other people that weren't invited.

I also think that we're going to have a smaller group that will help steer the efforts of what we do.

We just awarded a major IT contract we have. We outsource our IT department. I think we're still the only state agency that does that. We just complete our sixth year, and we're about to award the new one. They will begin transitioning and fully be on board this September.

Texas Innovation Alliance and Texas Technology Task Force Updates
Kristie Chin & Andrea Gold, Center for Transportation Research

We work closely with CTR to administer these programs, and they will give you an update on the work that we've been doing. The T3F and the Alliance are both programs that allow us to provide framework for innovation and technology. Transportation Technology at the tech side. The Tech, the task force is comprised of local, regional, national, government, and industry leaders. They start exploring emerging technologies that could impact our organization, or our transportation network and infrastructure, over the next 10, to 20, to 30 years. They look at emerging technologies that are far into the future.

Texas innovation labs and the Alliance is a network of local, regional agencies, and research institutions that provide more immediacy to the implementation of innovations and transportation technologies, where they develop, launch, and sustain a portfolio of projects.

The task force started in 2013 with the mandate of the Texas Legislature, or TxDOT to put together an advisory body to help identify and track some of the new technologies.

Q – I am curious about the revenue generating opportunities?

A - We've actually started a small paper, looking at different pricing strategies, and a whole suite of new revenue alternatives that it's not quite ready to go yet. We're waiting to hear how the study concludes from Seattle and what news comes out of New York. I think we're comfortable talking about it with some of the participants and also the efforts, but it's something that's on our radar.

Q – Are you guys looking at the impacts of increasingly severe and destructive whether to have the telecommunications infrastructure that underscores a lot of how we get information including transportation and the need for better routing information casing wildfires, floods, stronger hurricanes, or tornadoes?

A- One of the efforts that we both can play the real time data piece is just what tools are available to us. We worked with the city of Houston, Tarrant County, and the city of San Antonio to put forward the concept paper to the NSF civic Innovation Challenge. That was accepted. We're hoping to be able to work with those stakeholders, Houston, particularly with Hurricane Harvey. They've identified some new image analysis techniques that will help, hopefully be able to better automate their system to detect claims, and complement their sensor network. San Antonio had quite a bit of stakeholder engagement to just understand which neighborhoods are having the most impact. Also to try to understand the tradeoffs between how do you make the decision for higher need. Where there's an economic impact. Tarrant County - they work with the Waze Assistance Program. So people as they were inputting where there's high water content. They created a dashboard that information that was put out to distribute it to the public.

Lunch

Open Forum – updates from Committee Member's Organizations (During Lunch)

Comment - Last month at South by Southwest Secretary Chow announced the creation of a new council, called the Nontraditional Emerging Transportation Technology Council, and it's made up of representatives and USDOT tried to remove a lot of the silo we sometimes traditionally do, and how do you apply more of a department wide look rather than a mobile specific look at these emerging technologies.

Commissioner, Brigid Shea - Atlas 14 - How many are familiar with that and are using it in their construction design? Parks and Wildlife definitely should be. It's the newest data, the rainfall intensity, it was actually documented and recorded around the actual data. We're trying to be proactive in Travis County. It substantially outweighs the costs of some of our projects, particularly because high water crossings that we have to take an approach, where we think it's the responsible thing to do because it doesn't make sense to spend public money on infrastructure that you know will be inadequate to the size of the club. Another thing that I'm focusing on particular, is how to build community resilience in the face of climate change. We know we have more wildfires, more flooding, and deadly storms. We just completed a fire drill we were literally working on for a year with many of our community. As far as we could find any information, this was the first in at least the state of Texas, community ran neighborhood based fire drill and evacuation plan. They were motivated because they live in a very high fire danger risk and they have only one way in and one way out, which unfortunately is how a lot of the communities in Texas are in. So, we're going to learn from that and make it available widely and we're going to continue to do that wherever we can in Travis County so I'm eager for any of these kinds of innovations.

Jackie Sartor - Our mission is to not only attract and elevate women and minorities within transportation, but also educate the general public. We have a number of luncheons throughout

the year that are monthly luncheons. Our next one is next week on Wednesday. Ashby Johnson with El Campo will be our featured speaker, Al has graciously agreed to speak during our main lunch on May 15th, and at the end of this month we have our annual fundraising Gala. One of our biggest initiatives here on the local level is attracting young women to come into the industry and keep them in the profession. We give out about $30,000 to $35,000 each year at Gala, from high school students, all the way up through grad students, and to get them engaged in the community and the professions.

David Palmer – One area where we're trying to leverage technology specifically - our state crash team is taking the lead on that, but recently announced and working, or we can try to expand that to our regional crash teams as well, because they're a huge benefit. We'd have to get a hold of our aircraft folks to come out and do our area with photography, but now they can do it with the UAV. They do a lot of other things besides just that so that's quite a big area where we're trying to push forward. Not as much technology related but definitely a component, and they were very strongly pushing traffic Incident Management.

TxDOT Autonomous Vehicle/Research Peer Exchange Report
Rocio Perez, Research Division Director
James Kuhr, Research Project Manager

Two different topics that we discussed during the Peer Exchange: we discuss the research topic, which is mainly what we do. Mostly the research entities. That's what most Peer Exchanges are for, but at the same time we did get very good advice from one of our other division partners. This was a two day event, we dedicated the second day and divided up into two different groups - project implementation value research communication efforts and performance metrics.

The biggest takeaway was the EDC component, to incorporating our LTAP team to take on some of these EDC technologies and go out and disseminate to the local governments on these different technologies so that they can also be taking advantage of them. We are going to be traveling to Pennsylvania to understand their program. They have a very successful program. We will start benchmarking and see what is it that they're doing and what can we leverage and bring back to Texas.

California says they're changing their highway lane stripping to six inches. That's it. I was kind of hopeful that they had been working with people to develop a list of upgrades to the roadway system that they could offer, but know that just six inches on their highways makes a difference.

Closing Remarks -

Darren Anderson - Focusing more on trying to break all of you into it and then pulling from what's happening in other states. It's really about making sure we know in Texas, what everybody else is seeing.

Thanks for coming.

Meeting Adjourned!