

Thursday, December 5, 2019, TxSTIC Meeting Austin, TX

Presentations located here: http://www.txstic.org/docs/TXSTIC_dec5_presentation.pdf

Recorded Meeting here: <https://www.youtube.com/watch?v=6VY08n45whA>

Welcome and Introductions

Shelley Pridgen, TxDOT RTI

We are here today for the ninth TxSTIC meeting. I hope you enjoy what we have planned for you today. Please help me welcome Darran Anderson.

Darran Anderson, TxDOT Director Strategy and Innovation

Thanks for being here today. I hope this continues to be of value to you. I am very excited about some of the work that we've been doing with the LTAP program. We are looking at how to bring state level and national level research out to all parts of Texas and not just focusing at the state level. If anything that's been one of the greatest benefits of having these TxSTIC meetings. We've learned that that's an avenue that had been untapped and so I'm really excited about the opportunity to do that. Lots going on this month for me and for TxDOT and future efforts. We had the Texas mobility summit in San Antonio a few weeks ago. If you're not familiar with that that's a compilation of number of cities and regional teams that are focused on transportation and technology challenges related to transportation that support their people or their region, and their concerns. TxDOT helps facilitate that by bringing together that group at least on an annual basis by regular phone calls or telecons to talk about those things and find ways that we can bring solutions to particular problems and get the right industry folks in the right academic research to bear those efforts. Then if the solutions are viable and useful, to scale it more broadly across the state where a similar challenge might exist in another region or city. That is generally a new idea and really only Texas is doing it. I constantly get feedback as I go to different national forums about how amazing it is that we've been able to keep the Alliance going and keep the members working together as opposed to competing with each other for federal grants or competing to always be the premier city. Certainly, they want to still be that but it also brings a much broader scale to some of those efforts, and so we are very pleased with that and very appreciative of the city of San Antonio for hosting this year. Next year it looks like El Paso will do it, which is kind of cool to go out to the west. I was in Iowa at the beginning of this week at an AASHTO meeting (Association of State Highway Transportation Organizations). AASHTO has a committee that is looking at, should there be a national strategy for highway automation. They may change some of the language of the name of the strategy because they realize that it's highway focus. They realize that it might not touch on all the things that they're concerned about. But the good news is they are talking about it, they realize that something needs to be done in terms of commonality between states, especially as it relates to freight movement, but also in passenger vehicles as well. We didn't solve the world's challenges in two days, but we got things started which was really nice. I think that they've gone back with food for thought and things that they can begin to put together, and we can then go out to a much broader part of AASHTO. There were a number of partners there - ITS America, IEEE, and just a myriad of associations and organizations that have a play in the transportation field, especially the technology component. That was very beneficial. I flew back, went to San Antonio this morning, and spoke to the Texas Freight Advisory committee. I had a panel that they asked me to put together to make them aware of emerging technology in research related to the freight industry that they

should be tracking on and have visibility of when it might be coming to fruition. We could have probably spent the whole day as opposed to one hour answering questions once we started telling them some of the information we had. Then I drove up here and here I am. It's been a very positive increase in interest in where the future of transportation is going. This is a key aspect of that. Bringing in the research that is leading that effort into Texas. I'm really happy to do this too. I will be going to many other places in the near future as a part of our connected autonomous vehicle state task force to begin to educate and inform at multiple levels of political leadership, as well as the public, about the current state of those technologies, what they mean, are they safe, are they cyber secure, and all the major concerns. I think that's really the value that efforts like this and that bring to what we do at TxDOT. It is not necessarily being the ones that solve it all, but making sure that everybody understands where we are and where we're going. When I say we, a lot of times that's where is industry going so that we understand what they're thinking and how we are partner to that not just reactionary to it. I think that's key is not being reactionary. I really appreciate you being here today. AI is tied up this week. Let's get started.

Wrap-Up from Value Capture Peer Exchange

Rafael Aldrete, TTI

Over the last two days, we had a one and a half day workshop sponsored by FHWA and TxDOT. It was a part of the Federal Highway Administration's EDC-5 initiative. This part of the EDC-5 initiative is promoting the use of value capture strategies to state, local government, and MPOs.

The workshop had about 75 people registered. We actually had 50 yesterday. It was a very productive discussion. The presentations covered different concepts of value capture. Value capture is a set of tools and techniques that allows transportation, municipalities, and other agencies to take advantage of the economic activity, increase in growth and increase in development. Using additional property tax revenue for example, to help pay for transportation improvements. We saw different techniques. We had an overview of the eight types of techniques that federal highway is promoting. We had peers from throughout the state and from other states like Arizona talking to us about specific examples and case studies. Here from Texas we had TxDOT presenting about transportation investment zones at the state level, but we also had an example of a small municipality that has taken advantage of the CRC tool for transportation funding. We also had presentations on something called Joint Development impact fees and in sales taxes that are used in other states. Those are some of the tools which we have direct experiences from with people who had implemented those projects. One of the aims that Federal Highway had for this peer exchange was to help get some ideas for the next year work plan on how they will continue to promote the implementation and use of these value capture tools. Some of the feedback that we got from the participants today was to increase the availability of tools for local municipalities and MPOs to educate their policy makers, the city council members, the transportation policy board members, and the private sector. It was very clear that most of these value capturing innovative financing tools fall within the realm of the local governments so it's really important to provide them with the tools they need in order to increase awareness about the set of tools. So Federal Highway is going to be putting together the work plan for the next year, and they're going to be looking at possibly developing some of these tools like briefing books, short, concise infographics, and other material that they can use to brief the policy makers in an adequate and effective manner. Thank you.

Shelley Pridgen, TxDOT RTI

Thank you, Rafael for that update. I feel like the value capture peer exchange was a good example of collaboration between different entities. I actually participated in most of it and enjoyed hearing everyone's discussions. Kirk Fauver had a big hand in getting that together.

Crowd Sourcing for Operations

Amelia (Millie) Hayes, FHWA Texas Division

As a refresher, EDC is a state based model to identify and rapidly deploy proven but underutilized innovations. This year, 2019 FHWA announced the fifth round of EDC program. This offered 10 new innovations to improve highway safety, reduce congestion and promote environmental sustainability. Crowdsourcing for operations is just one of those 10 innovations, but it really overlaps, and collaborates with other innovations. Our overall crowdsourcing for operations goal is to increase the number of agencies that use crowdsourcing to better operate the transportation system as a whole, through new cost effective, and proactive operational strategies and applications.

Questions & Comments

Darran Anderson – The workshop – are they open to all elements? Is there any kind of who gets to go to workshops and not?

Millie Hayes – I think we would be able to accommodate whoever you felt would be needed there. We are pretty flexible with the workshops. We are able to fit your specific needs.

Marcus Wilner - Correct me if I'm wrong, a lot of times, Federal Highway can pay for one or two from each state to go to some of these peer exchanges and workshops. So, Darran I think if we have a couple folks in mind.

Darran Anderson – Has TxDOT asked for a workshop?

Millie Hayes - For Crowdsourcing? I do not believe they have.

Darran Anderson - Have any of those examples that you gave talked to the challenges that they've had with making it work.

Millie Hayes - There were some. I had seen a couple slides and I think it was on one of the q&a. It's like a six page document that had some specific things to take into consideration. I believe that was from different case studies that James and Paul had gathered together, but I can check that.

Darran Anderson - I mean, we've pursued working with Waze for actually many years. We're connected citizen agreement with them for the state, and we know that multiple cities in the state are in the same agreement with them. The challenge we've had goes all the way back to Hurricane Harvey. At the time we weren't signed on with them but that's really just a piece of paper. We were more than willing to open up Drive Texas data to them so they had real time information about flooding on the system. But what we found over time is we've really struggled with them on formatting that we could not just establish an API and say our data is here, here's how it's constructed, and you can go this API and consumer. They wanted us to take our data and format it into their formats, or they weren't going to use it. That's continued. We are really still in the infancy of sharing data with them, which is a source of frustration for me. I imagine since Google is now the parent company for them that Google Maps is not much different. I would guess the same for Apple. That API does exist and it is being used by federal agencies and state

agencies especially during emergency weather events. So we know that it's effective and its ability to share data, and we certainly believe things like construction zones and in weather related issues and other anomalies on the system are of value. The more we can share them is great because then we know that citizens are getting their information multiple ways now as it relates to the traffic situation. We really hope that we can get to the point where we're being fed data too that's data that we don't know. Right now we're more of an air gap, one screen beside another and looking at what they're reporting and going and validating ourselves. But if y'all can help us move that forward, we're more than willing to do that. I will encourage traffic division too, to reach out and see if we can't get a workshop going. Part of the challenges is just like in here. Who else needs to know, and many times they just don't know that this is out there and available to them. Then you mentioned the apps. We've always been on the fence on whether or not TxDOT should build any apps because we find it that the third party providers like Waze are much faster and much more able to do it than ours. I'm really interested the Delaware and the other state had built one. Maybe we'll look into adopting that and I'll talk to the CIO about it. I do see a lot of value if we recognize that the traffic management environment is so much greater now than just the government part of the public doing it. Rather than ignoring it we need to embrace it to a degree and realize it in a shared environment that will probably get more accurate data and more rapidly share that if we acknowledge that those guys are out there doing the same. Flip side of it though, they give different traffic movement solutions or mobility solutions than we do, so the bigger question I think we'll have to research over time is if you have multiple sources of information for traffic management are they conflicting with each other and ultimately not contributing to a greater optimization system. That's my thoughts.

Natalie Bettger - I can add a little bit because we actually incorporated Waze data into the 911 dispatch centers, but we've also incorporated into our 511 DFW system. The biggest challenge that we have is weeding out and weeding through the data. There's so much of it that comes through Waze. What we had to do is filter some of the items out that were related more to Traffic Operations, just because it would overwhelm your map with information out there. We were able to work with Waze to share data with them but the biggest challenge is the amount of data and being able to analyze it and kind of organize it so you can make sense out of the data that you have. I think that's one of the biggest challenges with some of this data that we're getting. We also get data from a third party vendor, here we get data for our speeds on our 511 DFW system and we have a performance measures background module that allows us to analyze before and after analysis on roadway improvements, whether that's arterials or freeways, manage lanes, things to that sort. So we do have a tool that allows us to kind of quantify the benefits a little bit more than us trying to go through a manual process to do that. We kind of question the same thing. We have a 511 DFW app, but at what point do we not maintain that app we just share that data with the third party or those private sector partners, because I mean they're better at doing some of this stuff than we are. Maybe we spend our money on the back end on how do we integrate the operation of our system for our public sector partners and we can better operate the system we have and let them feed the information to the public. We have an interactive voice recording as part of 511 too and it's really expensive to maintain. At what point do we not do that anymore? These are questions that I think are valid to ask and we just have to work through them as public sector agencies.

Millie Hayes - Especially regions here in Texas, I know y'all have done the most with the 511 integrating Waze, so I highly recommend if folks are struggling, especially in the beginning. It seems like y'all have

figured it out really well. Maybe it took a ton of time to get there but I'm just seeing it at the end the results which has been amazing.

Darran Anderson - I mentioned the workshop and peer exchange, but I mean, TxDOT or Texas as a whole, could have its own peer exchange because of the number and volume of cities and regions that could be brought into that. So I really think that maybe we can work that and tie that into the innovation Alliance, because that's where a large number of our cities are already represented. Maybe we just do our own and really take some of the lessons from the other states, and get to the point where we're actually solving some more of the challenge. I won't say leap yet but push that jump to the limits that we can get to.

Millie Hayes – That sounds like a great idea just to maybe look at doing a state specific peer exchange because it seems like every meeting that I'm at everyone else is talking about incorporating Waze data or something similar. I think folks are doing it and maybe we just need to get them on our own.

Comment - Is anyone doing anything to try to standardize this whole process across the country.

Millie Hayes - I think that would be our national folks. Trying to get people to be consistent.

Comment - Because each state could do it's own now. But then, if you're a traveler and you're moving from one state to another it would be helpful if your device would work wherever you're at.

EDC Project Updates

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

Within the EDC-5 weather responsibility strategies initiative there are two main themes. One of which is to develop new capabilities. The other is to increase the effectiveness and reduce costs. One component of that really feeds into what Millie just talked about, which is being able to really fold in information and feedback from the traveling public. What we want to do is implement a small scale weather responsive management strategy within a chosen area of Texas. In this case we choose to look at winter weather, and we're looking at the Abilene district. Within our management strategy, we're creating a data framework. We're incorporating different data sources into already existing Lonestar infrastructure, the active traffic management system used by several TxDOT districts, but also incorporating our own operational platform, off to the side, that allows us to prove concepts. We're intending to have both of these appear within the Traffic Operations Center, so that the operators can really use the data sources in one unique unified location. The two different data sources are the weather stations and the on vehicle road surface characterization devices. These are devices that we're intending to purchase through the project.

Questions & Comments

Natalie Bettger - I have a quick question. What is the device? You're putting devices on the vehicles like maintenance vehicles, or are you putting them on just the snowplow vehicles to detect road conditions?

Ken Perrine - To be determined. So, we had one such device put on a fleet vehicle (a pickup truck) that's used to go diagnose different areas of the region for ice conditions on the roadway and all kinds of other activities. It's the mobile eyesight, and it characterizes road surface temperature and road surface characterization. It would say whether there is ice on the road or slush. Even though in the ideal situation

we'd have one of these on each vehicle, the reality is that they're very expensive. So we still need to work in a very small scale, and try to understand as much as we can from that small scale - what are the potentials for that technology?

Natalie Bettger - Yeah, that's what I was going to ask - how expensive it is because some roving vehicles like our courtesy patrol or mobility assistance patrol vehicles might be perfect vehicles to put this type of technology on if it's cost effective.

Ken Perrine – Yes, I'm glad you mentioned that, because we have actually been in conversation with John Navares in Austin district about putting one of those on a hero vehicle. That's an excellent vehicle because the hero vehicles go all around the highway infrastructure within this region, and would collect wonderful data on roadway conditions, especially when there's a freezing weather setting.

Natalie Bettger - So, we are definitely interested in learning more about that technology when you get additional information.

Jeff Dailey - I had a question. I was just curious about the thought of getting the weather stations, you know the fixed ones, versus if you start implementing these mobile ones. I mean, what's the thought about a system and how that would affect things – would you still need them or not?

Ken Perrine - Right. Well, we have a lot of data sources, but in talking with the folks up in Abilene, they have their national weather service sources, which there's one at the airport, there's one about hundred miles away. They really want to know what's happening at the roadway. So they want additional sensors to fill the gaps, because they know their problem spots. They would much prefer to be able to look at a dashboard, online in their operation center, and see exactly what's going on there rather than sending somebody out there or trying to discern from their weather maps what might be happening in that region. They really do say that within a 20 mile radius the weather conditions can be very different, especially when there is precipitation. That's one of the reasons why they're interested in these smaller scale stations. If we can also incorporate additional data sources such as crowdsource observations, I think it would even be better. They're also very interested in the idea of these fixed stations because they know exactly where it is. If they have mobile stations, there's always the question of is the sensor in the right place at the right time. I think that's an ongoing research question that we're going to be very interested in addressing is how to best address this mobile data that could be in one location at one time and another location and another time to actually create a complete picture of the whole region.

Jeff Dailey – Yeah, we're looking at installing some on our roadway systems the weather stations as well so this is interesting about the mobile units.

Kirk Fauver - Ken you mentioned use of crowd source data in your presentation - is that part of your research or is that something that's next down the line sometime?

Ken Perrine - In our literature survey, both in the EDC-4 portion and the EDC-5 portion we've looked into that. We have not made accommodation for specifically looking at that. I think with this emphasis I am reminded once again that we're always flexible for adjusting to where the needs are. I think it is something that I do want to emphasize more as we progress. Just seeing how accessible crowdsource data would be, especially if TxDOT really is able to integrate Waze data more into various districts. I think this be very valuable and very relevant.

Darran Anderson - Just one other thought. I know a couple years ago I think it was Wisconsin, we signed an agreement with them to get their approval for video sharing off of their plows. And are you aware that?

Ken Perrine – No, A couple of DOTs were working on that, but I haven't really.

Darran Anderson – Yeah, we need to look at that and see if that is still available, and if that's something that we can get out into the districts, and then tie that into your work.

Ken Perrine - Yes, certainly. I think, too, if there's a common platform of the same data streams you can go through, then there would be some wins there. I also realize within research context, sometimes it's good to use individual isolated systems, one that measures a certain type of data point but another that does the plow counts, just to prove the concept and then understand a lot more on how to best integrate that all into a common system.

Advanced Geotechnical Methods – Seyed Mohsen Shahandashti, The University of Texas at Arlington

This is yet another EDC-5 related project. We are investigating the potential of using geophysical methods for advanced geotechnical studies. I'm going to talk about the schedule where we are, a little bit about what we did so far, and then the future plan that we have. We started the project early summer. We did an overview analysis of existing geophysical methods, and we started to identify what we thought had the highest potential for application here with conditions in Texas. We also started to put together a manual at very early stages. In the overview analysis we found that electrical resistivity imaging comes with a diverse set of applications related to geotechnical studies.

Questions & Comments

Darran Anderson - Yes, I have questions. Why do we care about the soil characteristics, what does that mean to us in terms of engineering?

Mohsen Shahandashti - Because our designs are dependent on that. For highway and pavement projects we want to know what is actually behind that. Even beyond soil characteristics it is something that is interesting. Those fissures, those sinkholes that we see, we are interested to know if we have those somewhere. We don't want to build a highway, then we have a sinkhole. So, they are going to help us. It's not that the boreholes don't help, it's a different case. The boreholes help, but at the locations where we have them we can have a continuous profile, which is helpful. For the Bridge project, same thing. We care where we put them. We want to know what type of soil we have. We are also doing some tests for sulfur content. We want to know that one because it has some implications for our foundations. So, these are the reasons that we collect. And these applications are pretty important. As soon as I call the district. I have meetings where I call districts in order to see interesting projects they have. I try to have even diverse applications. The variety of projects and application is important for me.

Darran Anderson – So it impacts your composition, the depth of the road bed, the actual location, I guess at some point you could actually vary the composition in depth if we got really specific and we didn't think it would change over time. Is that fair?

Mohsen Shahandashti - Yes it is. I can re-implement this process wherever I want. So yes, the reason that we are going after diverse applications is to be able in the future to repeat this project for any other application, but that is it a fair point that it is repeatable. The reason we have a diverse set of districts

implemented is because we want to have diverse applications, diverse characteristics in order to be able to repeat this process. We want the manual to be something that the other districts can use.

Darran Anderson - Your cross sections - were they lengthwise along the center line of the road, or do they reflect exactly where the centers are placed? Are you penetrating underneath the road in those cases? I know you did those two that were 15 and 20 meters away, or yards.

Mohsen Shahandashti – It goes back to how we implemented that. It actually varies for the places that they already had pavement, so they wanted to have samples from pavement. So, I couldn't do resistivity on the pavement, so I went a few feet to the right-of-way and I did it. For some places we go there before they start the construction, that is the case for Fort Worth. That was one related to a slope project. We had the chance to collect the data before the project started so I could do anywhere I wanted, so I did it exactly at the location that we were interested to have the data.

Darran Anderson - Are you finding that one image, close to that center line of that section is sufficient to reflect the composition for the entire width of that road or if you were in a case where you were building a new road would it be better to do images, basically by lane, would that make any difference?

Mohsen Shahandashti – We would like to recommend that we do it in several lanes. My goal is to have a 3D image. If I collect enough data I can create a 3D image of what we have on the ground. So my goal is have at least one case study to show the 3D image of that. It depends on the type of the project that we have. If it is a highway project it is different than a bridge project, but for highway project at least a couple of lines in order to capture the variability of soil. It is interesting because I pretty sure a lot of places are probably seeing this but in Texas the soil type is rapidly changing. In Paris district along one side of the highway is one thing, and on the other side is another thing. So that shows me that I need more than one line to capture that variability.

Darran Anderson - Is parallel better than perpendicular in the road. Does that make any difference? Have you even had a chance to test that?

Mohsen Shahandashti - We haven't tested that, but I will. My preference would be to do actually both, but now that you mentioned it for the one that we are going to do in Beaumont district next week or the last, the crew is going to do one perpendicular to the location. Next time I present here I will answer that question.

Darran Anderson - Is there a limit to the length that you can put the centers out? Obviously not physically, but is there degradation if you try to make the length too long to the accuracy of the resistance?

Mohsen Shahandashti – It is a physical limitation for me and depends on the instrument that we have. I have two types of instruments now 28 and 56 electrodes. For those instruments I cannot go beyond 56 electrodes. But this limitation cannot be imposed on the manual, because it depends on what instrument is used and I highly recommend that the district's buy something that meets their needs. I'm limited with that. I prefer to have all of them installed because I can go deeper depth. I don't want the distance between two of my electrodes to be more than 2-3 feet apart. I want to get good accurate data, especially at this stage that I am establishing the relationships that hopefully for decades to be used here. So at this stage I don't want to sacrifice accuracy to get more data. I want to get good quality data.

Darran Anderson - Are you specking out that equipment already, I mean to the degree where we could begin procuring it?

Mohsen Shahandashti - Yes. Actually, we have specifications for that. One thing I avoid in the manual, I don't write the provider of that, I'm trying to be as general as possible. I have recommendations if someone comes to me, but I don't impose it on the manual.

Darran Anderson - I know what the pictures tell me, but is the feedback from the real engineers coming back that look this is a major leap forward and in the accuracy?

Mohsen Shahandashti - In terms of what we had in discussions we had good discussions. That is not something that everyone agrees on. In the Fort Worth district, I collected data, their contractor also collected data, and we all agreed upon that. So in terms of accuracy we all agree. If I had some relationship associations, I want to use them probably in a few months, I could finish all the data collections. The hard part of this project is, I want to do resistivity imaging at the very same time that we do the drilling on the project. There are several reasons behind that. One of them is that these profiles that I showed you by season are changing. Those fissures, those cracks – during precipitation times they are going to be filled with water. As soon as they are filled with water their resistivity drops. So, I need to know what type of season I have at exactly the same time I need to collect the soil samples. Otherwise, the water content for example does not match.

Darran Anderson – Could this have potentially picked up karst formations on mopac?

Mohsen Shahandashti - This is interesting. Previously I couldn't answer this, but now we are tracking even the cracks. So karsts, if they are already in my radar of the collection they will be captured.

Jeff Dailey – We've got a project that we're going to talk about a little bit later about wrong way, but I did want to say the last meeting you had this topic, you presented on this and we took that. We've been searching Austin forever for a site for a park and ride express bus service on the south side. We all know how sensitive it is with all the karsts and Edwards aquifer. We had an opportunity area that we use this on. So a site that would have otherwise not been possible is now possible. We ran like eight lines. It's very interesting. I saw a lot of the same 3D stuff that you were showing here. What it's going to be able to do is kind of a green field site. It will also be able to lower the risk and the potential costs and gives you better knowns for the bid. Just from our experience, it's got a whole bunch of benefits out there and we plan to use that a whole lot more in our projects. I just want to mention that these meetings have been fantastic for information. Every single one we pick up an idea and use it. And hopefully we can report back in a year or so on how we use your technique.

Mohsen Shahabdashti - Wonderful. I'm very happy about that, and it is very interesting what you're doing. For that park and ride it was recommended and you probably saw the 3D images because you did it in eight lines. So it depends on what type of project. This is a very good example of where we want to have grid, not just a line for the data collection. The least that we can have, we can see anomalies.

Shelley Pridgen - That was a really informative presentation. In case you're not aware, it's pretty important like he said the bridge placement, you need to really understand that area. Sometimes they put in bridges without a full understanding of the field environment, you might misplace the bridge and it might wash away. My husband is a bridge inspector and he has shared with me some horror stories about things like that, so it's valuable research.

Automated Traffic Signal Performance Measures – Kevin Balke, TTI

This is part of the Every Day Counts program - Automated Traffic Signal Performance Measures. Really this is about a system that gets put into a traffic management center that collects high resolution data. Data from detection systems, data from the traffic signals themselves on the 10th of the second basis. It uses that to generate performance measures that are related to how well that traffic signal is actually operating and allows you to look at adjusting timings and things like that on the fly to achieve better performance of your traffic signal systems. In the past, we as traffic engineers would routinely go out and check our traffic signal timings every three to five years. What this new automated traffic signal performance measure allows you to do is to look at your objectives as to what it is that you're trying to accomplish at a particular intersection. You collect this high resolution data, deploy strategies and tactics and then you can kind of do a continuous feedback. You can constantly adjust your timings and things like that to improve the operations of the signal as it operates.

Questions & Comments

Natalie Bettger - What cities and districts are starting to work together to bring some of their data together related to traffic signals?

Kevin Balke - Houston district has a system that they put into play. It's a system that's a vendor based system. Fort Worth district has put in several different ones. City of College Station have some, and I think there are some up in the cities in the Dallas area. However, I don't know if anybody is really bringing everything back together to a single location. That's part of our project is to really see how you do that. How do you distribute that decision making process because the districts need to know and have that data at their fingertips to make those day to day decisions about how to manage operations. Where the division may need it to make long term policy making decisions and look at resource allocations and things like that. So there's a whole host of needs that has to go on and be figured out as we're going through that process.

Natalie Bettger - So you're figuring that out as you work through the process. That's what we struggle with in our region. There's so many different signal systems and then the districts have different signal systems than the cities have and each city has their own, and how do we integrate that because we need to make it seamless to the users of our system. It's hard to do with different systems.

Kirk Fauver - Do you see any benefits or air quality emissions benefits by going through and implementing autonomous or automated traffic signals synchronization?

Kevin Balke - That's a different question from the project that we're exploring here. I'll answer your question and yes I think there is some air quality benefits by doing automated performance measures, automated vehicles and things like that. What this system would allow you to do is if you had an air quality action day that you had to do an alert or something, you could potentially go in and look at how much am I contributing to those air quality impacts that exist, and what can I do, what kind of strategy can I implement, and can I measure that result. I don't think anybody is doing this yet, but by setting up the system, it potentially allows TxDOT to be able to have that flexibility to do those types of adjustments to change signal timing strategies and to measure the impact of those signal timing strategies for air quality benefits.

Natalie Bettger - So are you allowing any of this data to be shared with those vehicles that have the countdown for when the signals turn red and green? Are you looking at that as part of this project?

Kevin Balke – We are not really looking at that as part of this project. One of the vendors that we put up there and one of the vendors we looked at, that is their model for giving out that data and making that data available. That is one of the side benefits to them for allowing you to install their equipment into your cabinets so they can sell that or use that for other applications. City could do that as well if they wanted to. That is not the focus of this particular project, it's really about how do we bring that data back together so that we can make those management decisions about how to operate our traffic signal systems better.

Natalie Bettger - Are you looking at what type of platform might be best to do that, like a cloud based platform or individual based?

Kevin Balke - That's exactly one of the things that we're trying is do we know the cloud base? If we do a centralized, what kind of communication, is it cellular or whatever, to bring all that data back to a central location.

Break

Wrong Way Driving

Greg Mack, CTRMA

A little bit about Central Texas Regional Mobility Authority - we're a multi-modal transportation agency, created by the state in 2001. We operate in Travis and Williamson County. Everyone is familiar with the trends of wrong way driving. Wrong way driving crashes are horrific. They're usually very damaging with high fatality rates. Creating a detection system alerting the drivers when they are going the wrong direction is what we are trying to accomplish by implementing this technology.

Questions & Comments

Natalie Bettger - Have you looked at sending something through mobile devices like a reverse 911 type of notification if the mobile devices are in the vicinity of that wrong way driver?

Greg Mack - Yes, we looked at that. We didn't see any viable solutions. We asked our TAPCO the vendor and they haven't heard anything yet so if you know if anything let us know.

Natalie Bettger – It seems like it would be something that should be able to be done but I don't know for sure how to do it. As well as detection through mobile devices because the connected vehicles are coming but not all vehicles have that technology but most people have smartphones. So if there's a way that it gets to the level it needs to get at to detect that driver in the wrong direction on that facility through a mobile device I think it has a lot of potential because it can be activated on all of our roadways versus just where that technology is deployed. We are trying to do some of that within the Dallas-Fort Worth region, although I know in North Texas Tollway Authority and our districts are looking at deploying this technology similar to what you guys have on your facility at spot locations.

Greg Mack - We also operate MOPAC Express Lanes with one lane and three general purpose lane so we always try to figure out how can we differentiate our general purpose user from our express lane user. With GPS technology what's our bubble? 16 feet? So it's hard to tell where the vehicle is per lane. It would probably be easier to the wrong way application because it's a little bit more separated, you know the direction of travels is the more separate and 16 feet.

Natalie Bettger - The other thing that I think would be interesting to consider is when we work with the vehicle manufacturers can we get to the point that somebody is detected on the wrong way we actually stop their vehicles.

Greg Mack - That's where I think it's going. Do something to disable it, or can't even operate the motor vehicle if they are impaired. I think eventually this is coming. This is what we have now for technology, that we can do a visual alert. Hopefully the cars won't even let you go the wrong way, it knows the map of the roadway. When the RSU as soon as we pull up, it's giving you a high definition map of 45 southwest. We're trying as an infrastructure manager give you all the information so the vehicles that are listening. Here's what's coming up, here's a road closure or lane closure that we have planned, and let the car make some decisions.

Natalie Bettger - I don't know if anybody's using traffic signal detection technology to detect them going the wrong way on the frontage road before they actually get to the ramp. I would be interested to know if anybody's using that because I guess it can be done. It can detect something going the wrong way and if there's a way to notify them before they get on the higher speed facility that would definitely be a benefit.

Greg Mack – Yeah they have to get here somehow, and usually they're coming from the arterials. We are struggling with other technologies. We have the loop system. It usually goes 123, three loops. We're trying to get the toll system to also be an extension of wrong way travel where it says 321, that's going the wrong way. Let's use the tolling system, the technology that is already deployed to give us some help on alerting. The automatic incident detection, the cameras that we're looking at, also set claim. They say they can do a visual verification of the wrong way traveling so we're going to prove that out once we implement that software.

Jeff Dailey - The one other thing you may want to touch on is this is our pilot location but where are you going to put the rest of them. We have a contract with TTI help us plan that out. We're looking at 183 South and Mopac. Coming up with a plan working with TxDOT Austin district and City of Austin is going to be complicated for those frontage road type systems. Where's the best place to put them?

Greg Mack - With TISMO, we try to coordinate with the Austin district and as well as the City of Austin. Mopac we do have 911 data that shows wrong way travel. We see them in our express lane. Well if they're all the way in our express lane then they were going the wrong way before that. We don't operate those areas, so what can we do for our partners to help them implement wrong way technology? Is there hotspots that we can identify on MOPAC or even further? Sixth street leads to Mopac, so should that be a candidate location for wrong detection?

Darran Anderson – Does an email go out to multiple police agencies or is it sophisticated enough to know whose jurisdiction the incident is in?

Greg Mack - In the three and a half mile road there are three jurisdictions. Yes, so per site we can identify different distribution groups. That blew us away when we saw the lines, we were like okay three different responding agencies to this one little section of road.

Darran Anderson - I'm not promoting this company but to your question - I believe at least INRIX has recently offered a solution where they can geo fence a section of road and send out mobile alerts.

James Kuhr - Then also maybe Arlington, the travel safely app, I think might be another one to look at.

RTI Research Projects

Traffic Safety Improvements at Low Water Crossings – Kevin Balke, TTI

This is a TxDOT research project through their traditional research program. Why is TxDOT interested in this issue? Well, one of the leading causes of death in the state of Texas is flood related, vehicles getting trapped in water, low water crossings, and most of you heard this statistics before it takes very little amount of water to actually float a car to move it downstream. One of the things that we're looking at in this project is a whole host of technologies and things that we can implement to improve traffic operations.

Questions & Comments

Darran Anderson - There's an organization called Accelerate H2O that's focused in the Houston and coastal region right now. They've been working with LCRA to introduce centers for flood management, but also for the issues as it relates to flooding on roads. If you're not already tied in with them I think we need to get that done because they're looking for these things and opportunities to do them.

Kevin Balke - I'm not plugged in with them, but I will make a note.

Daily and Seasonal movements of Brown Pelicans – Andrew Birt, TTI

Today I'm going to talk about a research project with TxDOT called Daily and Seasonal Movements of Brown Pelican in the Bahia Grande Wetland Complex. So why on earth does TxDOT have interest in the daily and seasonal movements of brown pelicans? These birds really struggle when flying in headwinds and they crash onto the road or into cars on the roadway. When there are 1000 pelicans in the area and flying in theses weather conditions, there could be 100-150 birds that have landed on the road, and up to 80 birds being killed in a single evening. It is not good for the environment, it is not good for the ecology of brown pelicans or the region as a whole. This also causes trouble with safety on the road. When vehicles are traveling at 75 miles per hour, they may be tempted to swerve to miss the pelicans.

Questions & Comments

Comment - Any crash data attributed to the birds?

Andrew Birt – I have looked, but there is no reported crashes attributed to the birds. As part of this research we're actually looking at that interaction between the traffic volumes, traffic speeds. The volunteers on the roads are very adamant that the solution here is to reduce the speeds. I'm not sure it is because you've got to spot the birds first anyway. This is happening on dark days, with poor visibility. When those birds come close to the roadway and in your vision they basically meld into the road. They

are brown pelicans not the grey, so they are the same colors as the road. Lots of things to explore that would really affect whether or not a proposed solution actually feasibly can work.

LTAP Yearly Report

Bryan Sims, Texas LTAP

LTAP program is a national program, it is the Local Technical Assistance Program. Every state has one. It was initiated by the Federal Highway Administration. TxLTAP is funded mutually between Federal Highway Administration and TxDOT RTI. The University of Texas at Arlington has had the opportunity to serve as the management capacity of the program for the last four years. Basically, we provide assistance to all 254 Texas counties. We provide instructor led courses and provide technical assistance when requested. We have a website to include the mobile website, develop instructional curriculum for highway and roadway courses and then we produce a quarterly newsletter.

Questions & Comments

Comment - Have you considered integrating the EDC four or five in the different the classes you are doing for local government project qualifications or something? Like if there is innovative financing or value capture to be integrated in that portion because we have those classes statewide? And the work zone traffic control where we can bring ITS, or any innovation? Have you guys thought about integrating a portion of this as part of the existing training classes?

Bryan Sims – Yes, absolutely that would be the desire to do. Once we've identified what is important to these specific areas, then we would visit with federal highway, and we would take that existing training that is already put together, or presentations, from those subject matter experts and basically facilitate those meetings or those presentations in the area of the state.

Discussion of STIC, Past and Future

Kirk Fauver, FHWA

Right now, headquarters office is working to develop EDC round six. They're looking at coming out with a series of regional workshops in the fall of 2020. In November, December, January, they're going to put out a call to the DOTs, local agencies, public industry and etc. to provide feedback on a list of innovations that are going to go forward as part of EDC six. Some of these would probably be the same types of innovations you saw in the EDC five, but those are coming out, and we're going to keep you informed as those regional conferences come about. From those regional conferences will kind of scale down which ones are best for the state of Texas. Just to give some news, we did sign a new charter. Darran and Al signed it back in November. The new charter is available on the TxSTIC website. That outlines our purpose, vision, and goals for the next two years. It's also going to tell you the membership roster, which has changed a little bit. Next thing I wanted to talk about is the future of the STIC. We've got a series of questions we wanted to ask the members of the STIC. In the future we're going to focus on the Texas LTAP program and try to get EDC programs, funding, training, and so forth, in the coming years. So that's the future look at the TxSTIC.

Shelley Pridgen, TxDOT RTI

Poll Everywhere questions for TxSTIC council members.

Open Discussion

Darran Anderson - Well, I'll just say thank you for everyone's time. I hope that these things excite people or get them thinking about other ideas because that's what it does for me. I think we'll take back all this feedback, and I think all of these were valuable input. It's really what we need because if anything I've learned through this and other task forces that the hardest challenge has been informing and getting to people.

Kirk Fauver - On behalf of the Federal Highway Administration, I just wanted to thank everybody for last couple of days. We've taken a lot of effort to bring the value capture workshop here. We had a really good participation. We're going to have some more materials that we can go out and educate elected officials with. Today was an excellent STIC exchange and I just wanted to thank everybody for their participation. Hopefully it will continue in the next two or three years and we'll make better progress on some of these initiatives and be able to report back our successes. Especially our success stories. Thank you.

Shelley Pridgen - This was a very robust agenda, but I think we got a lot out of it. So thank you, James, for that. Thank you, Darran for being here, and thank you to all of you for being here. I really appreciate getting to meet you all. And I look forward to more meetings.

Adjourn