

Tuesday, March 6, 2018, TxSTIC Meeting, Austin TX

Welcome and Introductory Remarks

Kent Marquardt, Director Strategic Planning Division, TxDOT

This is our 5th STIC meeting. Welcome. Thank you for coming. This is an excellent conduit for research that is ready for deployment. Appreciate the work you do with the networking – that increases the project value.

TxDOT Research in FY19 – Sonya Badgley TxDOT

Project Selection is active! 270 problem statements was reduced to 23 for the RFP process. A list is available in the Master presentation document online at txstic.org and the actual RFP's are posted online at the TxDOT.gov site.

TxSTIC Project Updates 2018

1. Accelerating Traffic Incident Management Data Collection – Jeff Kaufman, TTI

This project is about the “Everyday Counts” data collection for better incident management.

Clearing an accident quickly and efficiently, depends on the level of training, quality of partnerships, and availability of resources.

Updates: the Austin District has semi-privatized the CTECC operations with a company called Serco. This has increased the TMC staff from 7 to 20. This has increased the amount of recorded events from 189 to 1939 in six months' time.

Additionally, TxDOT/Serco have assumed control of the HERO program and expanded coverage from 6 to 24 trucks.

Meanwhile, Houston's RIMS system has been using three different databases for capturing incident management data (TxDOT/TMC, MAP, SAFEClear). Starting in February 2018, all MAP/SAFEClear incidents need to be tied to a TxDOT/TMC incident. This has improved data collection from 90 – 200%.

Next - the merging of Crash and Incident Data. Possibilities and benefits were being explored. It was attempted and proved to be challenging. Manual judgement calls still required. And the data is inconsistent – incidents aren't always collisions, etc.

Performance measures are being reviewed – the big ones are Roadway clearance, Incident clearance time and number of secondary incidents that occur. However, secondary issues are Detection time, Verification time, Response time, Return to normal time, Responder time, True

incident clearance time, etc. It's a lot of data to sort through. For example, isolating gawker-related incidents on the opposite site of the freeway is a fresh, but necessary challenge.

Data sources under review for integration: Police Dispatch systems (CAD), Waze, Local Courtesy Data.

Q: How is the data itself showing incident management truly to be operating? Is it complete? Aren't there always going to be errors in detection methods?

A: The data that is automated is run off an algorithm that has specific T-1 to T-7 uniform documentation. But what about T-0? We're trying to run the algorithm backwards to see what happened when the incident actually occurred.

There is a secondary auto-detection mechanism in the algorithm that is almost working. But we have challenges in using so many different data sources. People collect data for different reasons, so it's not going to be consistent.

Waze still has several accuracy issues. Needs to be "truthed" and the display is sometimes poor.

Q: from Al Alonzi – great stuff! Incident can have many different causes, will the study look at automated ways to detect the incident cause?

A. At this time, it is kind of being done, it happens graphically from the Houston databases. I can see that it could be programmed so that data coming in, could literally map that information and turn the map segments red automatically. We would need to duplicate the data, though. It's a good idea. I'll ask my programmer.

Q: Does your algorithm take in account speed/events/weather/time of day/etc.? What historical data is included in the calculation?

A: Houston has collected incident data for a long time. There is a place to add these kinds of data points. However, correlation can be made without proper causation.

Q: Chris Klaus – how do we identify and do a better job of figuring out air quality issues? FHWA has "heat maps" – can these be integrated?

A: We're working on it.

Q: Kirk Fauver – can you better relay info from incident management data collectors to drivers?

A: depends on how it's reported in the system. Level of delay is dependent on many factors. Just automating all of this data will not work, judgement calls are necessary.

2. Road Weather Management – Weather-Savvy Roads – Kenneth Perrine, CTR

Project: Extreme weather (Freezing, Wild Fire, Flooding) in rural and urban areas impacts roads and people. Timeline August 2017 to January 2019.

Proposed solutions: 1. Data collection and data sharing during weather events needs to improve. Major challenges are too many sources, too different, not tailored. CTR is looking to create a

Data Catalog. 2. Sensor network needs to be developed to understand the ice formation and atmospheric effect impact. 3. Stakeholder meetings are proving to successful networking events. They create awareness, improve data, communication, and ultimately preparedness for weather events.

This project is now half-way complete. The data catalog is coming together and has been published in its preliminary form. A great way to start the next-level conversation. More collaboration, cleaning, privacy issues, resiliency technology, etc., need to be addressed in the second half of the project. Find the catalog here: catalog.NTNMC.org

Abilene has installed sensors and is getting data now. These sensors are both fixed and mobile. See more information about this in the slide presentation, available at TxSTIC.org.

Next steps: Build the catalog, Test the sensors, and deploy more of them, combine the tools, and make new process recommendations.

Q: Did you use predictive sources? Did you talk to local meteorologists?

A: Yes. Also the National Weather Service?

Q: from Jeff Kaufmann – Regarding flooding – do sensors detect high water and can they be attached to helicopters for see how high the water is and help identify and possibly mitigate damage?

A: Technology isn't really there yet. Helicopters more likely than drones.

Q: Are you looking at ways to automate reactions based on data? For example, Tennessee is looking to deploy barricades in areas automatically identified as “extremely foggy.”

A: all data must be manually reviewed before we can find a clear way forward.

3. Automated Traffic Signal Performance Measures – Brent Eastman and Henry Wickes

This project is the implementation of an EDC. Essentially, the goal is to bring high resolution data analysis of automated traffic signals in six pilot locations to increase safety and reduce congestion.

2 major challenges: First – there are 6200 signals in the state and only 9% are on a network. Goal is to increase this by 75% in 5-10 years. Second – Performance timing. Optimization requires more data, and money and real time adjustments based on current conditions, not just performance studies.

3 questions: How do we connect? How do we get the data? What should we be asking?

We are testing two models in six districts this spring. The Miovision option which is a private company, and the UtahDOT option. There are pros and cons for each.

Need for this project feels grave as we are looking at linked vehicles – need to have linked infrastructure.

Q. from Brian Moen: can we have access to VIDEO feeds from traffic signals?

A: if it's on the network, MAYBE. However, bandwidth is a major problem. We have a pilot project going to resolve some video sharing issues.

4. Validation of the PFC Underdrain to Remove Standing Water on Pavement Surface – Jie Huang, TTU (UTSA)

Permeable Friction Course Underdrains were created and tested in the lab. (The drains work great!) Results have been calculated. Diagrams have been proposed for future underdrain placement. Some are already being used in Japan and in Texas.

Problems are that it's expensive and doesn't last very long. However, this could provide Houston with a real solution to their flooding problems.

Houston and Beaumont have sites available for test locations. Final report for phase one has been produced.

Q: from Bryan Sims: Has vibration been tested for impact on vehicles?

A: No. Studies have been done on how PFC reduces noise.

Q: from Chris Klaus – What about how it performs under constant wet weather or with other variables?

A: Oregon started using it, but was too saturated. Ice increases the volume of the PFC and subjects it to cracking. So this needs to be used in southern states.

5. Data-Driven Safety Analysis (for Beaumont), Robert Wunderlich, RTI

This is an analysis of safety standards and whether they meet the nominal measures or the substantive measures. Wants to increase the integration of safety concepts into District activities.

We have two paths ahead to get safer road ways and help prevent 12 deaths per day on Texas roads. 1. Is to be proactive and 2. Is to use new analytics.

3 Elements of data-driven framework

1. ID the crash areas and existing prevention measures.
2. ID correlation between types of crashes and road features.
3. ID a means to integrate data into the project development process for both construction and maintenance. (And then bring this from Beaumont District to all the rest.)

Q: from Al Alonzi – When you analyze characteristics, do you go outside of the state/district? Does it matter? Can this eventually be scalable nationally?

A: Techniques suggest that using local calibration (like/like) is best, but it depends on the resources. Tailoring is awesome. NH and TX have very different situations.

Q: from Omid at UTA – Do you look at the vulnerability of the site with regard to incidents being risk mapped?

A: Yes. Risk is equal to the crash rate.

6. Implementation of Unmanned Aerial Systems in Texas, Anand Puppala, UTA

Presented via WebEx.

Introduction to Photogrammetry – the process of making measurements from photos/visual resources. This project is devoted to creating a manual for TxDOT's implementation of UAV's. Currently, they are doing photogrammetry assessments of pavement and bridge issues.

This will prove very helpful to TxDOT's inspectors. They are looking forward – moving from research to implementation. Great potential for AR/VR tech inclusion.

Q: Photogrammetry question – what is the level of accuracy?

A: Using as many as three to four visual resources (air, ground, sides), we can achieve 98% accuracy.

2018 Collaborative Research and Planning Announcement from the Texas General Land Office Community Development and Revitalization (GLO-CDR) Program.

Dr. Colleen Jones presented some background on the work that the GLO is doing and material on RFP's that are going to be put forth in CY 2018. More information can be found at texasrebuilds.org.

Lunch

Innovation in Texas Transportation Presentations

1. Texas Technology Task Force – Andrea Gold – CTR

T3F is an ideal platform for TxDOT to explore ideas about technology being integrated with infrastructure.

2. Texas Innovation Alliance – Kristie Chin – CTR

TIA is further down the schedule line from T3F – coming into play when Innovation is ready to be implemented.

Capturing the Value of Investments in Innovation, by David Esse, Innovation, Research and Technology Program Chair for WisDOT.

David's position was created at WisDOT to integrate technology and innovation. Calculating the Return on Investment (ROI) is essential in any evaluation of success, but so is determining if savings are being spent wisely.

Open Discussion – Rocio Perez, Director of RTI invited questions about what we should be doing at these meetings.

Bryan Sims – Following up from Kenneth's presentation about sensors giving real-time reports on roads in Abilene, would like to see development of collaboration for rural areas for school closings. ISD, PD, TxDOT phone tree development, perhaps?

Chris Klaus – Would like to see us associate all projects to the performance measures dictated by FHWA.

Unknown man – Infrastructure talks without industry professionals/contractors is empty. Where are the contractors? (Answer: they're invited – contact Sonya for a formal invitation.)

Barbara Koslov – Thank you! Interesting material. I am also part of the T3F and wanted to be sure we are pulling together the threads on all of this related work so that efforts are not duplicated. Perhaps a mapped project development board could be shared. (What is RTI/STIC doing? What is TIA doing? What is T3F doing?) this could help improve collaboration and coordination.

Closing Remarks – Al Alonzi, Division Administrator, FHWA

5th STIC meeting! Happy to see so many familiar faces. Hope you're coming for the value of the information and not the turkey sandwiches. Great to see people starting to work together – but there's lots more to come!

Many positive things are happening. Darren made a recent presentation to the state legislature about ways that technology and innovation are being researched and implemented and the legislature loved it. They were pleased that we are so forward thinking and not doing things like that joke about 2 engineers who both fell asleep under a tree for 20 years. The civil engineer got up and went right back to the job site, but the computer engineer was completely useless.

We need to keep up the good work and continue to be conservative champions of integration technology. It's being noticed and that's great news for us.

I appreciated the GLO presentation about more opportunities that are coming available for people to help make our systems more resilient.

The EDC (Everyday Counts) Round 4 is coming to a close and we are looking to Round 5. Typically, FHWA looks for new ideas during this period and there are 11 that have been

presented by TxDOT. We will be reviewing these 11 within the Districts in the months ahead. (A list is available at RTI.) Get involved in these discussions.

Remember that we are only one of the 50 STIC's. Every six months, there is a national meeting. This year it is a 90 minute webcast presentation on the NDDOT on fiber optic cable being installed to capture real time data. They are the first ones to implement this UK defense industry technology.

Please consider attending (virtually) on April 19th, 2018 from 1:00 – 2:30PM.

We will have a second webinar to follow to discuss the implications of this presentation and the other best practices presented in the hour following. No turkey will be served.

Next TxSTIC meeting will be in June, 2018. See you then!

Thanks for coming.

Meeting Adjourned!