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TECHNICAL MEMORANDUM

TxDOT IAC – Technical Support to the CAV Task Force

DATE: September 1, 2021

TO: Zeke Reyna, TxDOT
Strategic Research Analyst, CAV

COPY TO: TTI_Reports@tti.tamu.edu
Tim Hein, Research Development Office, TTI
Ed Seymour, Executive Associate Agency Director, TTI
Robert Brydia, Senior Research Scientist, TTI

FROM: Beverly Kuhn Research Supervisor
Senior Research Engineer Texas A&M Transportation Institute

RE: Data, Connectivity, Cyber Security and Privacy Subcommittee
August 5, 2021, Meeting Notes

Attendees:

Beverly Kuhn	Texas A&M Transportation Institute
Beverly West	Texas Department of Transportation
Bobby Cottam	Burns and McDonnell
Brent Eastman	Texas Department of Transportation
Brian Steiner - CHAIR	Cisco
Darran Anderson	Texas Department of Transportation
Ed Seymour	Texas A&M Transportation Institute
Erik Simpson	Vantage Trading LLC
James Hubbard	Texas A&M Transportation Institute
Jason JonMichael	City of Austin
Jeff DeCoux	ATRIUS Industries, Inc
Jordan (Alex) Payson	City of Austin
Joseph Hunt	Texas Department of Transportation

Julia Monso	Cintra
Leighton Yates	Alliance for Automotive Innovation
Lori McMahan	Toyota
Monika Darwish	Embark
Robert Brydia	Texas A&M Transportation Institute
Sam Dreiman	Argo AI
Scott Carlson	Iteris
Steve Pustelnyk	Central Texas Regional Mobility Authority
Steven Smith	McKinsey & Company
Sumeet Kishnani	Stantec
Syl Majid	Argo AI
Thomas Bamonte	North Central Texas Council of Governments
Tony Reinhart	Ford
Zeke Reyna	Texas Department of Transportation

- I. Opening Comments/Roll Call – Zeke Reyna, TxDOT**
 - Welcome to meeting
 - Roll call of attendees

- I. Chair Welcoming Statement – Brian Steiner, Cisco**
 - Happy to participate in this subcommittee
 - Thank you to all those who participate and give support to drive this industry forward

- II. Review of Meeting Structure – Robert Brydia**
 - Mural Board overview
 - Inviting open discussion from subcommittee
 - Opinions
 - Thoughts
 - Questions

- III. Subcommittee Discussion – Robert Brydia (facilitator)**
 - **TOPIC:** Establish IOO needs/desires for AV company data exchange related to key areas of improving operations or informational assessment capabilities
 - Private sector might also have needs; not just public agencies/IOOs
 - The conversation needs to be about what data is being asked for, shared, and how is it going to be utilized and how is it helpful to move the overall technology forward
 - How will the data be used to advance the technology?
 - How do we prioritize data given the overwhelming amount that may be available and where is it stored?
 - Measurements or classifications for the data? What will be do?

- Example: does the data on the location of potholes really needed?
 - Set priorities because we have a limited set of resources.
- Mutually agreed to priorities; and how we set those priorities (include in topic); need a process for that prioritization
- A Framework for the Priorities . . .
- ...Mutually agreeable prioritized IOO needs....
- Challenge with prioritizing which data you need, how can you handle it, how do you managed that since the sheer volume might be overwhelming
 - Is that data competitive in nature?
- Focus on structure or the data that can be shared? Do that simultaneously?
- View two-way data sharing as a way to optimize both travel experience (OEM) and highway operations (IOO). Only share data if sharing advances both OEM/IOO interests.
 - Examples: (1) Real-time roadway conditions; (2) Roadway maintenance issues (e.g., striping) that interfere w/ADS operations.
- The stand advance OEM and IOO interests; that is the hard metric and we are only going to focus our efforts on data that advanced both interests.
 - OEMs reciprocate the response for that highway conditions
 - Information about real-time highway conditions (work zones, etc.)
- Have OEMs identify aspects of the infrastructure that are impeding their ability for their ADS to operate optimally (data sharing in that fashion; help the IOO optimize the roadway environment to support the efficient operations of the ADS vehicles)
- IOO's are currently paying to get user data but then providing processed or analyzed data back to OEM/others for free. Is this reasonable in the future.
- From the development side, this is in such the early stages that it might be difficult to qualify what data set would be needed that is substantive; there is a lot of data and mapping that is being used for the development of the technology; might not be that much of it; very early stages in this entire process; there is already data being shared at the federal level through the AV Test framework
 - Hesitant to select one data set or category from either side (public vs. private); not an easy 1-1 exchange - proprietary issues with certain types of data.
- What would be helpful? Traffic flow; work zone information; etc.
- Difference between useful and extractable
- Framework/ structure for prioritizing data
 - Advance interests of infrastructure owners and OEMs.
 - When can data can be developed by and acted upon by infrastructure owners and OEMs.
 - Cost/ difficulty of acquiring the data. Data is in early stages and may be only provided in limited resolution and quantity.
 - Adds significant value to existing data sets.
 - Includes intellectual property rights
- On the public side, TxDOT and our MPOs through our innovation alliance members are participating in AV TEST. Much of that data is really about just the location and some specifics of a deployment location...they aren't focused on operations.

- Do the OEMs/AV developers view a smooth and efficient "travel experience" relevant to their business--i.e., good travel = happy car customers = more sales? If so, then that is a basis for data sharing that improves roadway operations?
- Every AV industry rep should know that Brent Eastman oversees access to our API for Drive Texas that allows access to construction zone location information, along with other info about flooding or other hazards...on the TxDOT system. We want to reach the point where it is inclusive of city and county roads.
- Data on the performance of automated vehicles driving behaviors and traffic interaction to aid in modeling, simulation and forecasting. This helps the IOO better plan and prepare for these vehicles. This could be a challenge at this stage as this is likely proprietary and constantly evolving
- Set of characteristics; identify a process to identify the type of data to be collected or shared; gate questions that once they are met, help prioritize and move forward on data sharing
- Pick one data set that would meet the needs of both OEMs and IOOs; go through all the aspects of that data set?
- **WORK EFFORT**
 - IOO Interviews
 - 1-on-1 (initially) - will get more honest conversations
 - case study approach might be helpful
 - We do need to talk to third party aggregators--e.g., Inrix, Wejo--because OEMs are probably more inclined to share data through them rather than via OEM-DOT connections.
 - Define the who and what before the how
 - Industry Interviews
 - Review of other states
- **PRODUCT: Data Governance Issues Paper**
 - Have to lay out the process of engaging and exchanging before we worry about the nuts and bolts of data governance
 - Understand the process; agree about what data will be exchanged; then decide what the governance will be once it is there
 - Describe the "what" before the "how"; also need to determine the "whos"
 - Meaningful for those in Texas but provide insights to other states?
 - what does the ecosystem look like? who are all the players? There is a way to carry a rule set with the data
 - User of the information? individual driver vs. an autonomous vehicle? dynamic messages also relevant? messages delivered based on the location of the vehicle and not relevant to the sign
 - what does the ecosystem look like? who are all the players? There is a way to carry a rule set with the data
 - Roles and responsibilities are key; need to have that conversation
- Potentially Secondary Product: Trial Data Lake

IV. Next Steps – Robert Brydia

- Step back, reframe a statement about what we're doing based on insight and input from today

- Full Task Force meeting next week – presenting all this to larger group
- Start moving forward with what we've heard, start having these conversations to help us flesh out what this is.

V. Closing Remarks – Brian Steiner, Cisco

- Thanks to everyone for participating.
- Tackling a difficult subject, but love that we are getting set up with frameworks and how to broaden sharing models
- Excited about the path forward.

Additional comments in chat:

[10:28 AM] On the public side, TxDOT and our MPOs through our innovation alliance members are participating in AV TEST. Much of that data is really about just the location and some specifics of a deployment location...they aren't focused on operations.

[10:28 AM] Do the OEMs/AV developers view a smooth and efficient "travel experience" relevant to their business--i.e., good travel = happy car customers = more sales? If so, then that is a basis for data sharing that improves roadway operations?

[10:30 AM] Every AV industry rep should know that Brent Eastman oversees access to our API for Drive Texas that allows access to construction zone location information, along with other info about flooding or other hazards...on the TxDOT system. We want to reach the point where it is inclusive of city and county roads.

[10:33 AM] On the flipside, IOOs will be more inclined to bundle and share their data w/OEMs if OEMs are making ADS vehicles that will (a) perform significantly more safely than human-driven vehicles and (b) will allow highways to function more effectively through things like platooning, reduced lane width requirements, etc. IOO effort is directly tied to ADS benefits. That ADS business case for IOOs is still in flux.

[10:37 AM] Road closures, construction, and other road condition information from TxDOT is available at www.drivetexas.org. If you need access to this information via a direct data feed, please e-mail me, Brent Eastman, brent.eastman@txdot.gov, and I can help get that started.

[10:39 AM] We do need to talk to third party aggregators--e.g., Inrix, Wejo--because OEMs are probably more inclined to share data through them rather than via OEM-DOT connections.

[10:54 AM] Can TTI's data sharing work with the AV trucking companies on the TCFC project be a case study/starting point for this subcommittee's work?