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TECHNICAL MEMORANDUM

TxDOT IAC – Technical Support to the CAV Task Force

DATE: February 9, 2022

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
January 31, 2022, Meeting Notes

Attendees:

Anne O'Ryan	AAA Texas
Beverly Kuhn	Texas A&M Transportation Institute
Bobby Cottam	Burns and McDonnell
Brian Steiner	Cisco
Darren Anderson	Texas Department of Transportation
Donald Davidson	Volkswagen Group of America
Erik Simpson	SeatsX
Finch Fulton	Locomation.ai
James Hubbard	Texas A&M Transportation Institute
Jeff DeCoux	ATRIUS Industries, Inc
Jordan (Alex) Payson	Jordan (Alex) Payson
Karan Khosla	HDR, Inc.
Kjeld Lindsted	Panasonic

Leighton Yates	Alliance for Automotive Innovation
Lori McMahon	Toyota
Matthew Smith	Michael Baker International
Rama Dhanikonda	COR
Ravali Kosaraju	WGI
Reza Langari	Texas A&M University
Robert Brydia	Texas A&M Transportation Institute
Sly Majid	Argo AI
Thomas Bamonte	North Central Texas Council of Governments
Tony Reinhart	Ford
Zeke Renya	Texas Department of Transportation

I. Opening Comments – Zeke Reyna, TxDOT

- Welcome and thank you for attending this first meeting of the year for the Data subcommittee. We appreciate everyone taking the time to attend an participate
- Review of members and attendee list in lieu of roll call.

II. Chair Welcoming Statement – Brian Steiner, Cisco

- Welcome as we jump into this this fun and exciting time
- As always, this group is is very communicative, direct and thoughtful to share different perspectives and we look forward to the input and accomplishments of this group.

III. Mural Board Discussion – TTI Team

- Focus
- Audience: CAV developers and state agencies
  - Goal: Productive mutually beneficial sharing of data between and among parties involved in operating and using our transportation system
  - Deliverable: Establish a framework by which the data exchange process between IOOs and OEMs can take place for a set of mutually agreeable prioritized needs. The framework should focus on the who and what and the process for determining those items via sustainable 2-way dialogue.
  - Goal for Today: Status update / Deliverable Content / Interview Requests
- Deliverable Outline
  1. What is a Data Exchange?
     a. Definitions
     b. Types of Data Exchanges
     c. Baseline Functionality
     d. Value-Added Features
  2. Data Governance
     a. Steering Committee

b. Data Owner
c. Data Steward

3. Security and Compliance
4. Implementation Considerations
   a. Data Set Characteristics
   b. Data Environment Characteristics
   c. Scope Constraints
5. Challenges and Issues
   a. Trust
   b. Critical Mass
   c. Data Integration

- Comments:
  - It would be good if the paper would lay out the "value proposition" for both public and private sector in exchanging data--e.g., How IOOs can provide better roadways for AV/OEM operations if they have certain AV/OEM data and how AV/OEMs can provide a better "product" if supported by data IOOs possess. That sets the stage for focusing on specific use cases.
  - Work zone data exchanges are already underway with federal support/leadership; if state efforts can be linked to that it reduces barriers; common safety vision all are working toward; no proprietary information on this path
  - Suspect that OEMs are weighing whether they are better off (a) sharing/selling their data to third parties (e.g., GM -> Wejo) who then process and sell it to public sector or (b) entering into data exchanges directly w/public sector. The "value proposition" for public private data exchanges should address.
- Interview Process
  - **Data Exchange**
    1. What does a Data Exchange mean to your organization?
    2. What types of data does your organization not have, but would like to have?
    3. What types of data are most important to you organization?
    4. What types of data would your organization be able to contribute?
    5. Are there any use cases that would benefit your organization that you're missing data for? (Specifically, what are you missing in this use case?)
    6. What would be the biggest hurdle your organization faces in participating in a Data Exchange?
    7. How would your organization benefit most from a Data Exchange?
    8. What do you think would be the ideal uses cases for a Data Exchange? (Public and Private)
  - **Privacy**
    1. Would there be privacy issues with your organization participate in a Data Exchange for these use cases?
       a. NDAs
       b. PII
    2. What kind of data would you be willing to share in the above uses cases?

3. What mechanisms would your agency need to have in place to ensure that proprietary data stars non-public?

- **Security and Management**
  1. Please provide your opinions on whom should own/manage/operate a Data Exchange?
  2. What types of safeguards would your organization require to participate in a Data Exchange?
     a. Access controls?
     b. Use notifications/approvals?
     c. Cloud configuration?
     d. Encryption?
     e. Disaster Recovery Response?
  3. Please provide your opinion on any Data Exchange best practices you have encountered.
     a. Safeguards
     b. Management
     c. Standardized formats
     d. Repeatable processes
- **Specifications**
  1. Does your organization adhere to any published data standards, or do you use your ow specifications?
     a. Ask by use case
  2. Would your organization require data it receives through a Data Exchange to comply with a data standard?
     a. National, State, Local, Company
- Comments
  - helpful to have information on anticipate costs, update, etc.
  - Challenge: Find the minimal viable project
  - Work Zone Data Exchange
  - US Voices Effort ($10M Data Exchange)
  - RITIS (UMD) - Case Study
- Who will participate?
  - Sly Majid
  - Lori McMahon
  - Kjeld Lindsted
  - Finch Fulton
    - Tony Reinhart

- Use Cases
  a. Infrastructure
     i. Pothole
     ii. Pavement Distress
     iii. Wheel Path Rutting
     iv. Longitudinal Markings
     v. Short Line Markings
     vi. Ghost Markings

vii. Guardrail
viii. Sign
ix. Markers
x. Signal
xi. Roadway Lighting
xii. Work Zone

- Comments:

- Potentially a very interesting case for organized sharing
- Truck Parking availability. The Texas CAV Corridor workgroup is also considering this. We could plug into that and have a collaborative effort

b. Operations

i. Traffic Congestion/Queue
ii. Poor Weaving
iii. Inadequate Acceleration/Deceleration Area
iv. Undesirable Roadway Geometry
v. Disabled Vehicle
vi. Object in Road
vii. Accident
viii. Work zone
ix. Restricted Lateral Clearance Areas
x. Equipment Constraints based on Visibility Conditions
xi. Truck parking availability

- Comments:

- Who will be responsible for obtaining and aggregating data: Probably more than one data source.
- PNT (more than just GPS)
- Near misses instead of accident after the fact
- Digital Twin data

IV. Next Steps – Bob Brydia, TTI

- We're going to continue to enhance what we're finding, while taking a look at these case studies.
- We're going to get some more of these interviews done. Thank you for everybody that has volunteered, and I may reach out to even focus a couple folks that haven't volunteered.
- As we pull this stuff together, we will put a draft document together, put in front of you for review, meet to go over it, and then work to continue to enhance and flesh out the document to make sure that it's representative of the subcommittee thoughts and what they would like to see is recommendations.

V. Closing Remarks – Brian Steiner

- Just want to say a big thank you for everyone participating in such a privilege to to be a part of all these conversations.
- Thank you to to Darren and TTI and Zeke, for all the effort you guys are putting in as well.