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TECHNICAL MEMORANDUM

TxDOT IAC – Technical Support to the CAV Task Force

DATE: September 10, 2020

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: Freight and Delivery Subcommittee
 August 21, 2020 Meeting Notes

Attendees:

Aidan Ali-Sullivan	Nuro
Andrea Chacon	Texas A&M Transportation Institute
Andrea Chavez	Grace & McEwan
Ashley Myers	Grace & McEwan
Brent Skorup	Mercatus
Brian Moen	City of Frisco
Brittney Gick	Texas A&M Transportation Institute
Captain Steven Rundell	Texas Department of Public Safety
Caroline Mays	Texas Department of Transportation
Chelsey Tanaka	Ike Robotics
Daniel Goff	Kodiak Robotics
Dr. Michael Walton	University of Texas Center for Transportation Research
DuWayne Murdock	Texas Department of Motor Vehicles

Jason JonMichael	City of Austin
Jeff	Autonomy Institute
Jeff DeCoux	ATRIUS Industries, Inc
Katie Herbek	Ford
Kristie Chin	Texas Innovative Alliance
Michael Sanders	Lone Star UAS Center of Excellence and Innovation
Monika Darwish	Embark
Paul Avery	AECOM
Payson, Jordan (Alex)	City of Austin
Robert Brydia	Texas A&M Transportation Institute
Thomas Bamonte	North Central Texas Council of Governments
Victor Delagarza	AECOM
Zeke Reyna	Texas Department of Transportation

I. Opening Comments/Roll Call – Zeke Reyna / Daniel Goff / Michael Walton

- Zeke welcomed everyone and called roll of attendees
- Daniel thanked everyone joining and those who made advance preparations
- Interesting and exciting conversation to be had regarding infrastructure
- Important opportunity, not only for Texas, but for entire US

II. Review of Meeting Structure – Robert Brydia

- TTI reviewed the agenda and discussed using MURAL to support commenting on the white paper outlines.
- White Paper Polling Results
 - Infrastructure clear first topic
 - Combine Freight & Safety into one WP to avoid overlap
 - Safety WP move to next topic of Safety Cases and Related Data
 - Coordination potential for next WP topic of Freight

III. White Paper Outline – Facilitated Discussion

- Terminology – 29 terms were suggested and discussed for addition
- Freight – Infrastructure Outline
 - Introduction
 - Motivation
 - Contextualize why important to Texas and Texans
 - Why Texas needs to be leader in this space
 - Develop narrative to demonstrate improvements
 - Mobility
 - Safety

- Quality of life
 - Resiliency
 - Preparedness (COVID, hurricanes, etc.)
 - Reduce congestion
 - Improve air quality
 - Reduce commuting time
 - Create jobs
 - Driver shortages
 - COVID-related challenges
 -
- Scope of White Paper
 - Opportunities part of narrative that propel Texas into the future
 - Economic
 - Connectivity between urban and rural
 - Land development and multi-modal facilities
 - Technologies can help address labor shortage in long-haul driver market
 - Continued innovation in freight intensive state
 - Appropriate use of resource
 - People good at spontaneity and adaptability
 - Computers good at repetitive and monotonous tasks
 - Benefits to Texans
- The Freight Surface Transportation Ecosystem
 - May need a value proposition statement for each environment aspects
 - May need a “state of Texas” aspects as an intro to each environment
 - Long-Haul: Highway Environment
 - How automation bring jobs to Texas
 - How automation can reorient our entire national freight system
 - Description of the CAV infrastructure environment
 - Texas interstates – “middle mile”
 - Construction Zones are biggest challenge
 - Challenge roadway environments
 - Potential need for inspections pilot with Highway Patrol
 - Construction zones
 - Vehicles on shoulder
 - First responders
 - Infrastructure recommendations
 - Lane lines
 - State of good repair
 - Further standardize construction zones required
 - Minimize forced merges
 - Real-time construction portal
 - More/better/more standard signage
 - Wider, better-marked shoulders

- More spacing between lanes and k-rails in construction zones
- Short-Haul: Arterials, Warehousing, and Distribution
 - Description of the CAV infrastructure environment
 - Staging from ports
 - Warehouse model
 - Store to store delivery model
 - Micro Warehouse G2B G2C B2B B2C model
 - Challenging roadway environments – Transfer points
 - Shift to long-haul (transfer piece)
 - Infrastructure recommendations
 - Look at intermodal facilities of future
 - Designated warehouse zones
- Last-Mile: Local Streets and Sidewalks
 - May need to address different business models in this space
 - Focus should be on building infrastructure to create environment where private sector will come up with business ideas to follow
 - Description of the CAV infrastructure environment
 - What is being delivered / restricted?
 - Parts of the congestion mix in urban areas
 - Concept of shared last mile of goods to minimize congestion
 - AV trucks could be restricted to night driving to reduce congestion, improve day travel
 - Ability for 24/7 last mile delivery of goods to minimize rush hours after work or early am
 - Impact considerations of micro urban warehouses and ghost kitchens for av based e-commerce & food delivery
 - What types of vehicles – LSV/NEV's, standard vehicles (+25 mph), and PDD's
 - Challenging roadway environments – Curbside management, left hand turns
 - Concerns around parking on street and off (dedicated AV loading/unloading)
 - Speed limits – many operate < 25 mph – constraints on roadway network and TAM
 - Accessing / driving on sidewalks, crosswalks, bike lanes
 - PDD visibility when crossing roadways
 - Challenges crossing signalized intersections – signal timing not adequate, statute (552a) silent on requirements or limitations
 - Automated gas / charging stations
 - Mobile carrying devices in crowded areas
 - Infrastructure recommendations
 - Parking / loading – dedicated ZOV spaces

- Deploy ITS infrastructure to collect roadway conditions from AV to the TMC
- Communication between freight vehicles (especially low speed) and traffic signals
- Data sharing / exchange models
- Deploy RWIS devices to provide real time and actual roadway conditions for AV
- Concept of metropolitan goods hub for enablement of fully automated delivery of goods
- Concept of metro AV's such as busses, move both people and goods
- Infrastructure operations and private company data exchange needed – status of work shared
- Recommendations
 - For Texas Legislators
 - Vehicle code update / cleanup as it relates to AV / ZOV delivery
 - Provide tax incentive for AV
 - Encourage AV initiatives on every roadway project
 - More flexibility for local governments in managing streets and speed to accommodate bots
 - Look at existing AV's operating
 - Update code: 550.023 (duty to give information and aid)
 - Update code: 545.1 (ex: mufflers)
 - Create / lead AV conferences discussing best practices with legislators of other states
 - For Infrastructure Owners and Operators (IOOs) – State and local
 - Action Item: Find TTI paper on sections of code that may not be applicable to AV's
 - Publish Outreach: increase awareness of AV's delivering goods, making highways safer
 - Assess what needs present before environment adapted to accommodate (figure out what it looks like to get policies in place for flexibility and adaptability)
 - Develop way to test technologies that don't take lengthy approvals
 - Identify what the AV corridors like (now and future), then design standards to follow – nothing today has references to types of tech coming.
- Potential WP topic – Rights and Responsibilities of Roadway Users

IV. Next Steps – Zeke Reyna / Daniel Goff / Michael Walton

- Daniel thanked everyone for great discussion and work in progress
- Setting ground work for deep dives and ongoing discussion for future
- Next SC meeting in 4 – 5 weeks

V. Closing Remarks – Daniel Goff and Michael Walton

- Thanks for team effort