What are connected and cooperative vehicles?
Building an Automated / Autonomous Vehicle

- Level 0 – No autonomous systems
- Level 1 – One semi-autonomous system
- Level 2 – A combined semi-autonomous system
- Level 3 – Periods where the car is in control
- Level 4 – Some driving autonomous
- Level 5 – 100% self driving - “No steering wheel”

- GPS
- Collision Warnings
- Adaptive Cruise Control
- Lane Keep Assist
- Autopilot+, Cruise
- Self Driving most of the time
- Self Driving all the time
Why autonomous and connected?

- Autonomous: Safety, accessibility, efficiency, environmental, time
- Connected vehicles and infrastructure can alert other vehicles.
  - Potential to eliminate or mitigate the severity of up to 80% of all unimpaired light vehicle crashes (NHTSA).
- Connected vehicles and infrastructure can work together to increase efficiency.
- The best autonomous vehicle is a connected vehicle.
  - Redundancy input for autonomous systems
  - Works in some areas autonomy does not:
    - Blind corners
    - Fast cars from different directions
    - Hard to detect pedestrians
State of Texas Legislation regarding automation

**SB 2205, 85th Legislature (2017)**

- SB 2205 creates a legal framework for the operation of automated motor vehicles in Texas and explicitly allows an automated motor vehicle to operate on highways in the state, with or without a human operator, under certain circumstances.

**HB 1791, 85th Legislature (2017)**

- HB 1791 authorizes an operator of a vehicle equipped with a connected braking system that is following another vehicle equipped with that system to be assisted by the connected braking system to maintain a clear distance or “sufficient space.”

**SB 969, 86th Legislature (2019)**

- SB 969 governs the operation of a personal delivery or mobile carrying device in a pedestrian area or on the side or shoulder of a highway.

**Takeaway:**

Texas Law is one of the least restrictive in the United States and makes an attractive market for AV testing and deployment.
Texas as a hotbed

Aurora will test its fleet of self-driving cars and semi trucks in Texas

The Lone Star State is an official hotbed of AV activity

By Andrew J. Hawkins | @andyjayhawk | Jul 20, 2020, 2:06pm EDT

https://www.theverge.com/2020/7/20/21331418/aurora-self-driving-cars-semi-truck-av-texas-robotaxi
Texas Connected Freight Corridors
Connected vehicle news

- A lot of cars are connected, but not exactly how we think.
- Right now there is a lot of debate in DC, reducing the spectrum from 75 MHz to just 30 MHz.
- TxDOT, ITSA and AASHTO have urged the FCC to preserve the spectrum.
TxDOT CAV Support Structure
Texas Technology Task Force

Mission: Support TxDOT by outlining clear, actionable strategies

Past meetings: https://www.txdot.gov/inside-txdot/division/planning/texas-technology-task-force.html
Emerging Transportation Technologies

- Drones
- CAV
- Air Taxi
- EVs
- Data Security
- Truck Platooning
- 5G
- Hyperloop/HSR
- ITS
- Auto. Last Mile
- E-Scooters
- MaaS
- Maritime
CAV Task Force mission and functions

- Prepare the state for Connected and Autonomous (CAV) advancements (good with the bad)
- Scope: surface and air transportation connected and autonomous vehicle technology and enablers, such as telecoms, and future infrastructure
CAV Task Force subcommittees

- Data, connectivity, cybersecurity, and privacy
- Licensing and registration
- Freight and delivery
- Government, research, and private sector cooperation
- Emergency and Disaster Response
- Education, communication, user needs
- Safety, liability, and responsibility
- Future Workforce
- Infrastructure Needs
Planning

Texas Transportation Plan 2050

Emerging Transportation Technology Plan (ETTP)

CAT
ITS
IT Connectivity
Freight
Etc.

TCD
Maintenance
Construction
Design
Public Transportation
Etc.

Connected Network Strategy

Executors
Strategies

- Emerging Transportation Technology Plan. Strategies to address new and disruptive technologies while implementing the long-term vision outlined in the Texas Transportation Plan 2050 (TTP 2050). Provide a framework for addressing emerging transportation technology, with four underlying focus areas that are needed regardless of the type of technology:
  - Data management
  - Scenario planning
  - Project and program development
  - Business processes.

- Cooperative Automated Transportation Strategic Plan and a Cooperative Automated Transportation Program Plan. These plans contain policies, strategies, pilot programs, and deployments for emerging connected vehicles and autonomous vehicle technologies.
  - Prepare TxDOT for the emergence of connected and automated vehicle technologies;
  - Maximize the potential benefits of connected and automated vehicle technologies; and
  - Position TxDOT as a leader in connected and automated vehicle technologies and innovation.
Texas Freight Network Technology and Operations Plan, identify freight-related challenges and needs and outline potential strategies to guide technology and operations related investments on the Texas Multimodal Freight Network.

- Truck parking availability system (TPAS)
- Smart work zone information
- Safety warning detection system
- Statewide traffic operations center
- Smart freight connectors
- Blocked rail crossing traffic management system
- AV infrastructure, signate, data
- High resolution freight traveler information system
- Centralized data repository for freight information
- Bi-national traffic operations center
Texas Innovation Alliance

Action network of local, regional and state agencies and research institutions who are committed to addressing community mobility challenges by creating a platform for innovation

From a Smart City to a Smart State

- Teams representing 11 Texas cities/regions and three research institutions
- Over 30 different transportation agencies
- Industry sponsors (data, OEMs, AEP firms, others)
- Use cases identified by each team
- Combined approach to grants and programs: AV proving grounds, ATCMTD
- Shared expertise and solutions
- New mobility, real-time data, common TMS, seamless mobility, freight and logistics, energy, resiliency, equity

txinnovationalliance.org
Texas Mobility Summit 2020, Sept. 29-30th, Virtual

Policy

InnovationAlliance

Expertise

nuro

ITS America

Flytrex

Leadership

U.S. Department of Transportation

Ford Mobility

City of Seattle

https://www.txinnovationalliance.org/texas-mobility-summit-2020
How to get involved

- CAV Task Force: Zeke Reyna Ezekiel.Reyna@txdot.gov
- Texas Technology Task Force, Texas Innovation Alliance, Texas Mobility Summit: Yvette Flores Yvette.E.Flores@txdot.gov
- In Outlook:
  - Infofeed or CAV Work Group help: James Kuhr James.Kuhr@txdot.gov