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AUTONOMOUS VEHICLES REGULATION AND STATE DEVELOPMENTS

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Morgan Lewis Automotive Hour Webinar Series

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NOVEMBER 11 | Environmental Developments and Challenges in the Automotive Space

DECEMBER 9 | Capitalizing on Emerging Technology in the Automotive and Mobility Space

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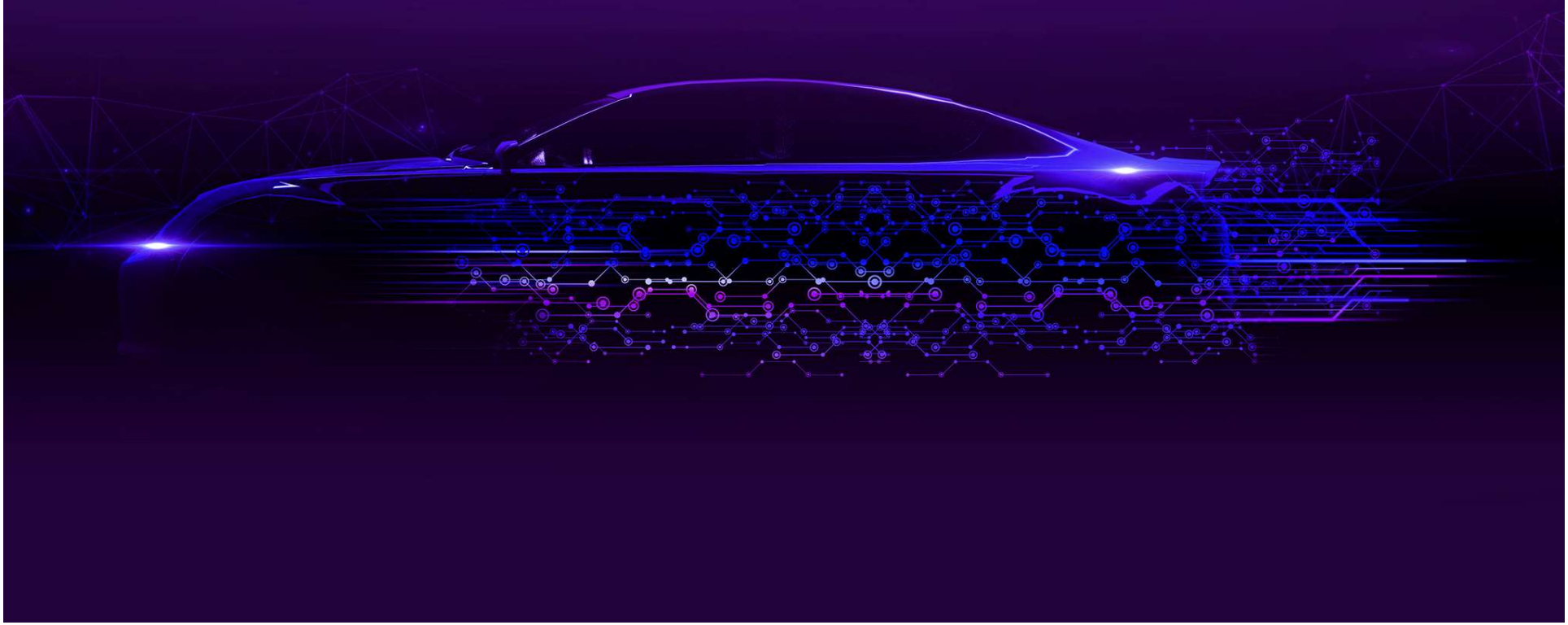

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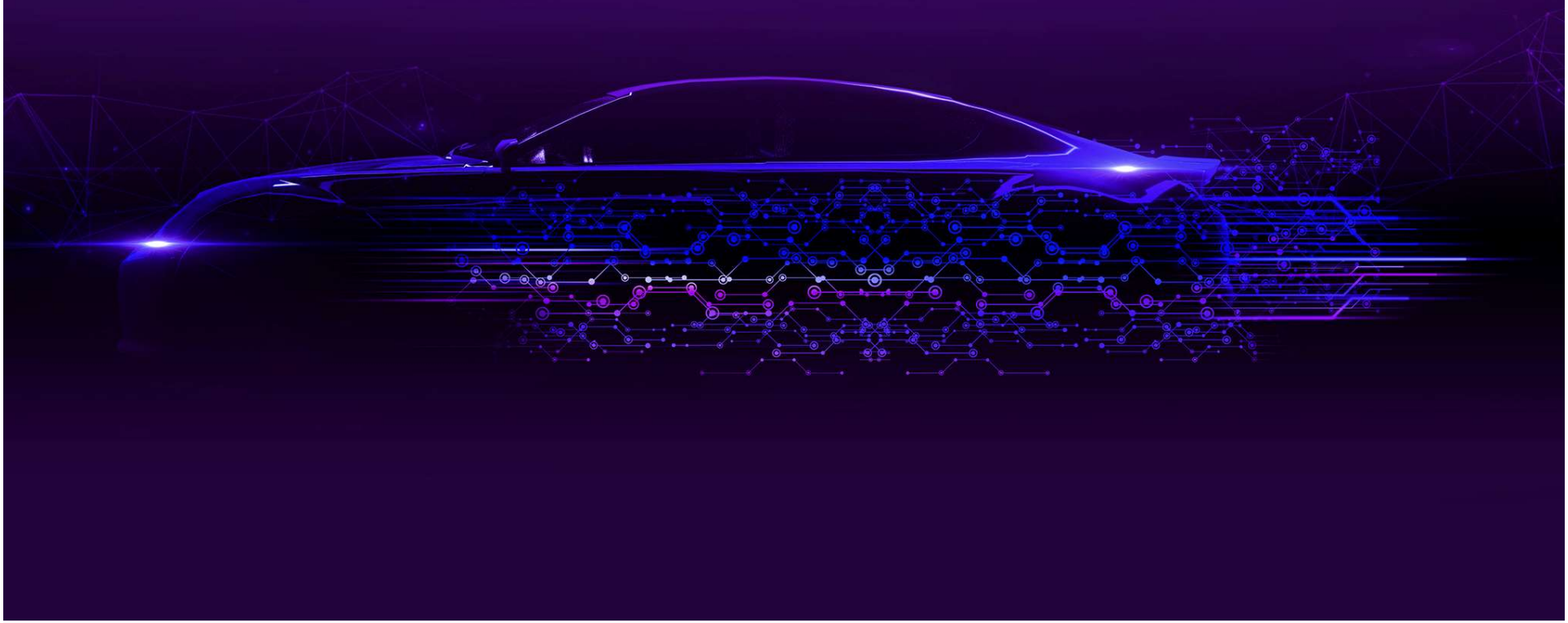
SECTION 02

FOUNDATIONAL CONCEPTS



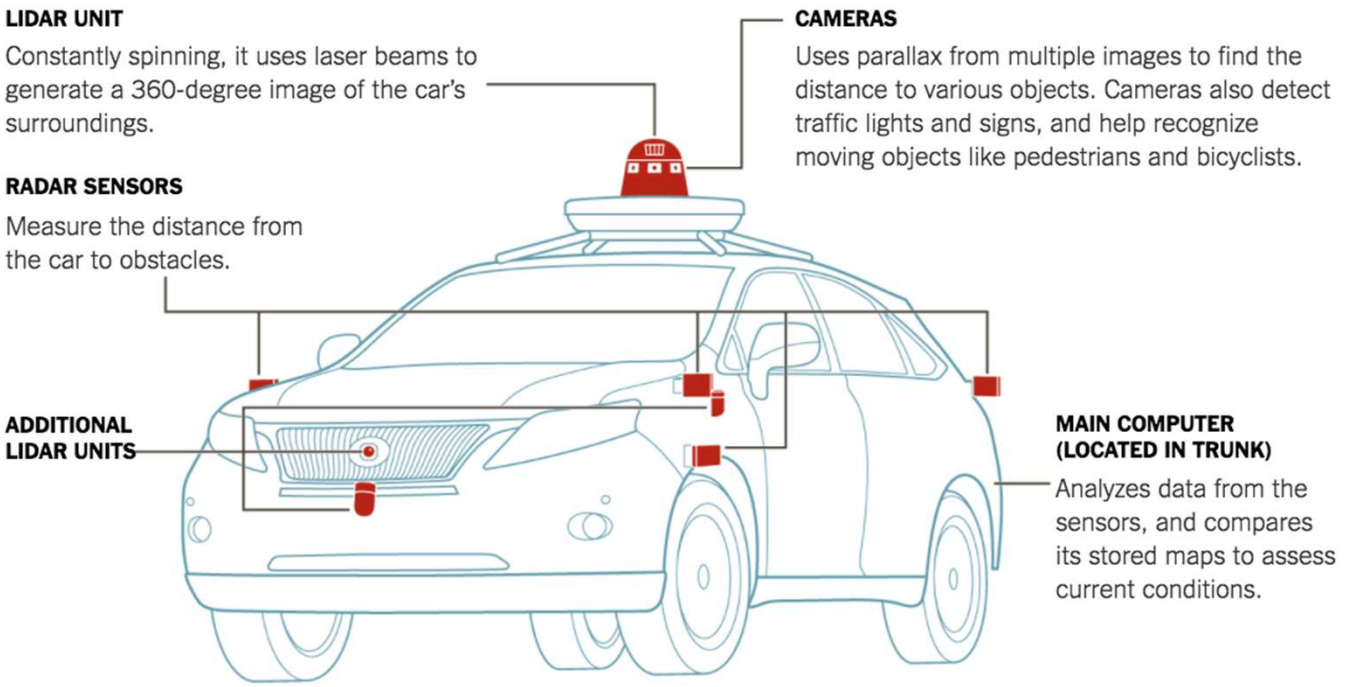
Foundational Concept – Levels of Automation

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE) AUTOMATION LEVELS

Full Automation

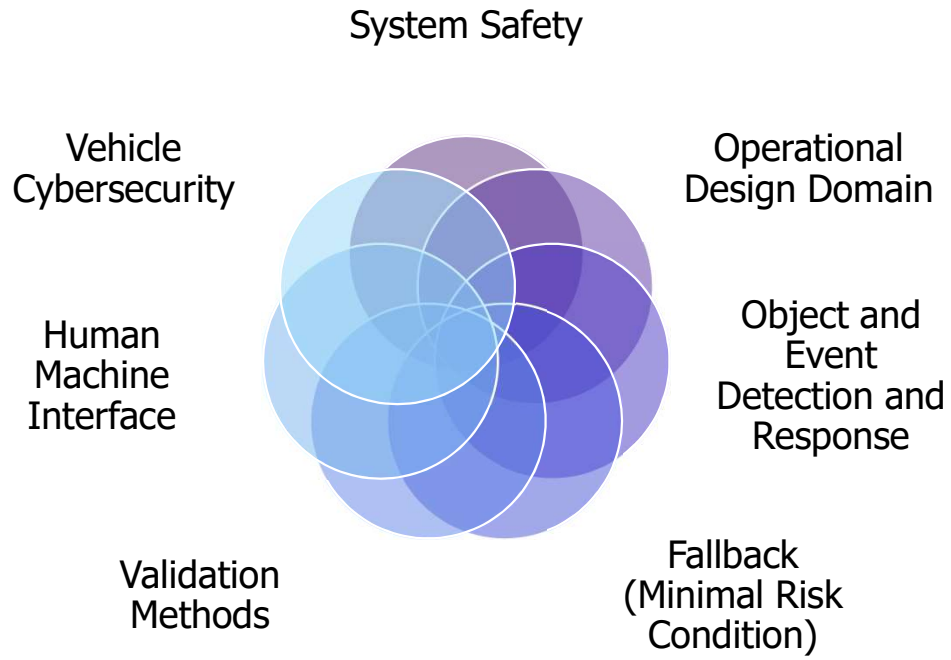
0	1	2	3	4	5
No Automation	**Driver Assistance**	**Partial Automation**	**Conditional Automation**	**High Automation**	**Full Automation**
Zero autonomy; the driver performs all driving tasks.	Vehicle is controlled by the driver, but some driving assist features may be included in the vehicle design.	Vehicle has combined automated functions, like acceleration and steering, but the driver must remain engaged with the driving task and monitor the environment at all times.	Driver is a necessity, but is not required to monitor the environment. The driver must be ready to take control of the vehicle at all times with notice.	The vehicle is capable of performing all driving functions under certain conditions. The driver may have the option to control the vehicle.	The vehicle is capable of performing all driving functions under all conditions. The driver may have the option to control the vehicle.

Foundational Concept – Levels of AV Safety



https://www.nytimes.com/2018/03/19/technology/how-driverless-cars-work.html

Foundational Concept – NHTSA Elements of AV Safety



Foundational Concepts – Elements of AV Safety

Operational Design Domain

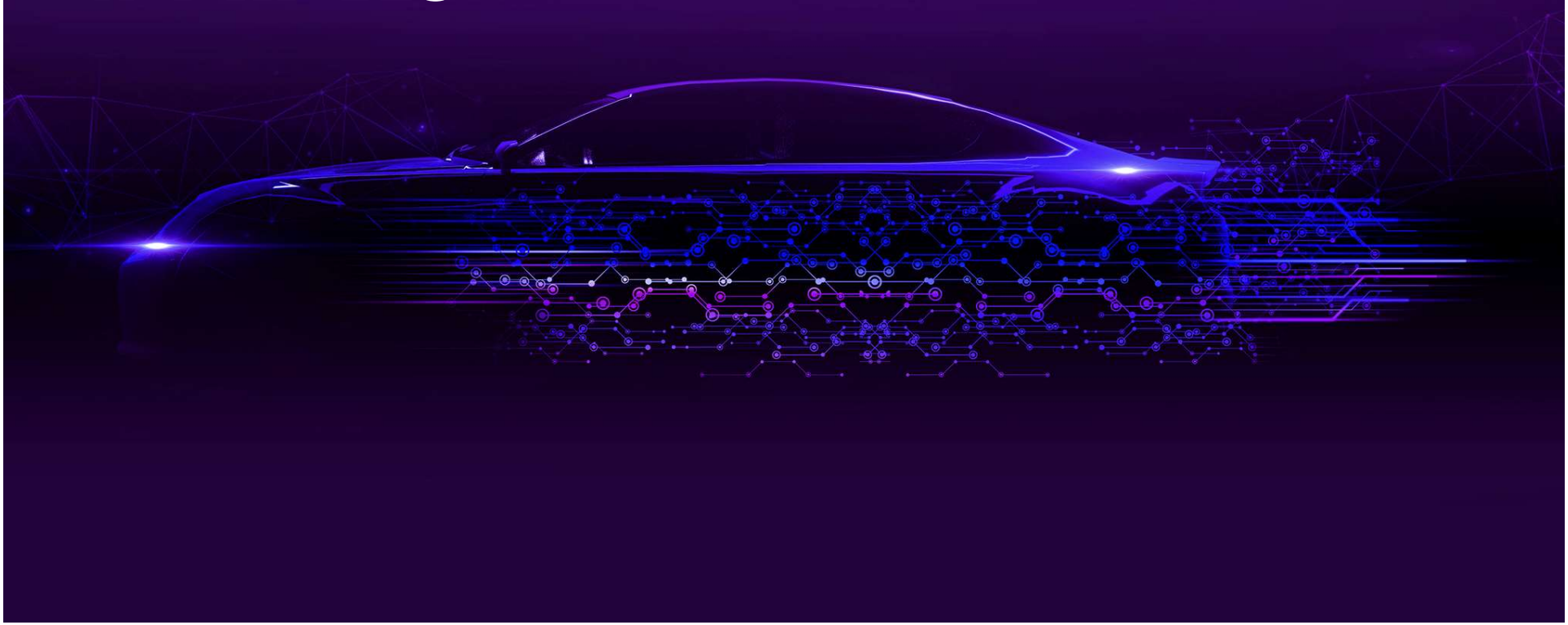
- Defines where (such as what roadway types and speeds) and when (under what conditions, such as day/night, weather limits, etc.) an AV is designed to operate.

Minimal Risk Condition.

- A minimal risk condition will vary according to the type and extent of a given failure, but may include automatically bringing the vehicle to a safe stop, preferably outside of an active lane of traffic.

SECTION 03

FEDERAL LEGISLATIVE INITIATIVES



Autonomous Vehicles – Federal Initiatives

Efforts to Pass Federal AV Legislation	"Safely Ensuring Lives Future Deployment and Research in Vehicle Evolution Act" (**SELF DRIVE Act – H.R. 3388**)	First major US legislation establishing policies for regulating self-driving vehicles. Designed to speed up adoption of self-driving cars and preempt states from setting design, construction, and performance standards; failed in 2018.
	"American Vision for Safer Transportation through Advancement of Revolutionary Technologies Act" (**AV START Act – S. 1885**)	Companion bill to SELF DRIVE Act; excluded self-driving trucks from bill; failed in 2018.
	Still no comprehensive Federal AV legislation.	

DEPARTMENT OF TRANSPORTATION AUTOMATED VEHICLES 4.0

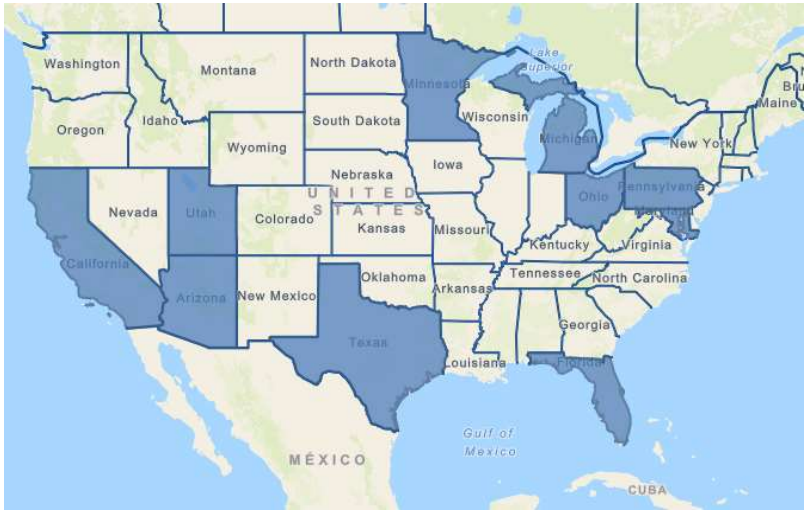
"Ensuring American Leadership in Automated Vehicle Technologies: Automated Vehicles (AV 4.0)"

- Builds on prior voluntary guidance, with focus on unifying efforts in automated vehicles across 38 federal departments, independent agencies, and commissions, but maintains DOT's hands-off approach to AVs.
- Details 10 principles to protect users and communities, promote efficient markets, and facilitate coordinated federal approach to AVs.
- States that U.S. government will promote "voluntary consensus standards" as a mechanism to encourage increased investment and innovation, but provides little detail on how the "consensus standards" will be developed.

https://www.transportation.gov/sites/dot.gov/files/2020-02/EnsuringAmericanLeadershipAVTech4.pdf

U.S. NHTSA's AV Test Initiative

- AV TEST Initiative launched in June 2020 – creates new test tracking tool.
- Goal to provide the public with direct and easy access to information about testing of ADS-equipped vehicles, information from states regarding activity, legislation, regulations, local involvement in automation. This in turn, increases the public awareness of on-road testing, safety precautions, and principles guiding the testing.
- Aggregates and makes publicly available nationwide data on existing autonomous vehicle testing, based on *voluntary reporting*.
- Tracking Tool shows on-road testing locations and activity data (vehicle type, manufacturer, use, vehicle counts, presence of safety driver, and routes or zones).



- Shows state-by-state vehicle operation regulations, emergency response plans, and legislation.
- Currently tracks AV pilot testing in 10 states: CA, AZ, UT, TX, FL, MN, MI, OH, PA, MD.

U.S. NHTSA's AV Test Tracking Tool

- Red dots represent location where a company has reported testing.
- Larger dots indicate a higher number of reported vehicles tested.
- San Francisco and Detroit: no surprises.

*https://www.nhtsa.gov/automated-vehicles-safety/av-test-initiative-tracking-tool

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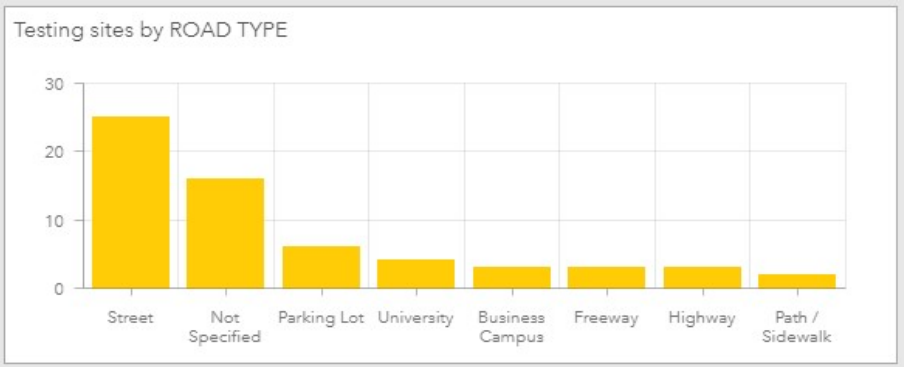
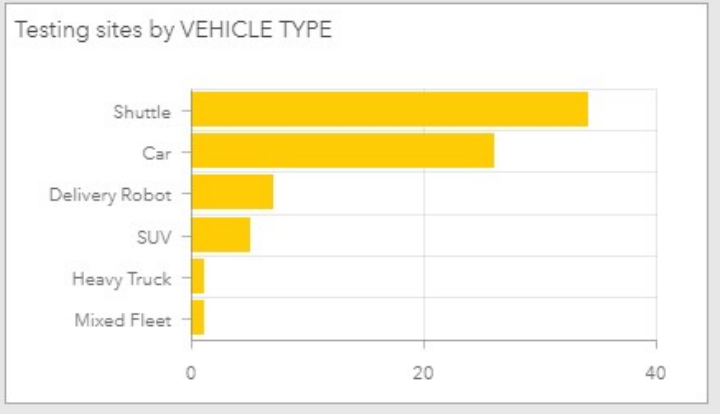
U.S. NHTSA's AV Test Tracking Tool





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*https://www.nhtsa.gov/automated-vehicles-safety/av-test-initiative-tracking-tool

U.S. NHTSA's AV Test Tracking Tool

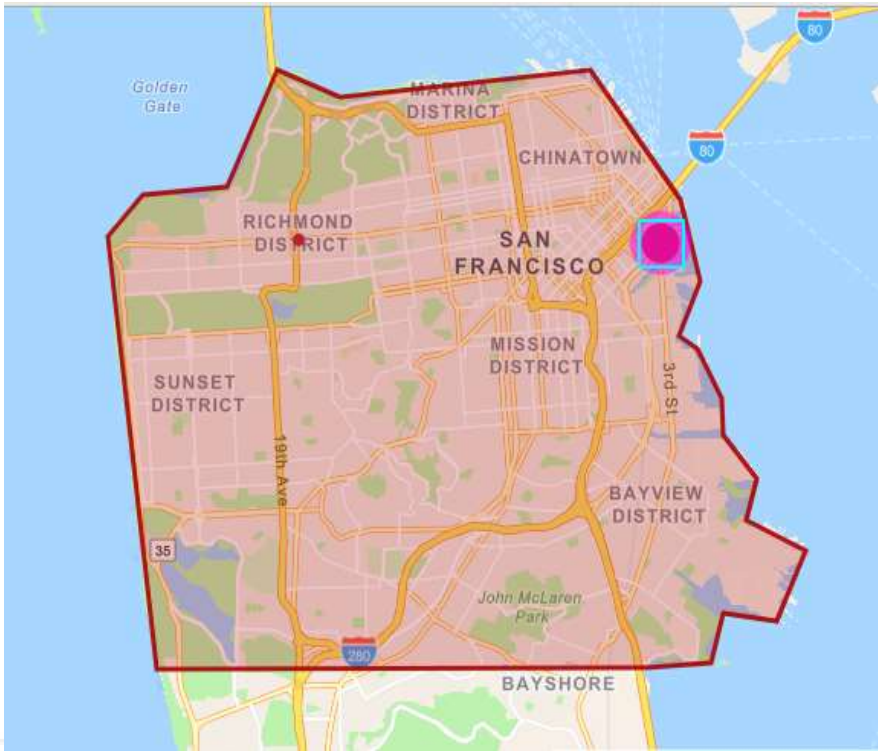
- Tracking Tool Attributes
  - Participation voluntary
  - Reporting metrics optional
  - Full scale of testing may not be captured.

On-Road Testing

GM/Cruise
San Francisco, California

Operation Status: **Active Zone**
Activity: **AV Testing**
Vehicle: **Car, CHEVROLET BOLT EV**
Number of Vehicles (approx.): **230**
Road: **Public Street**
Safety Driver: **In-Vehicle Safety Operator**
Use: **Employee Riders**
AV Technology by: **Cruise LLC**
Vehicle Manufacturer: **GENERAL MOTORS LLC**
Site Coordinator: **Cruise**
Site Operator: **Cruise LLC**

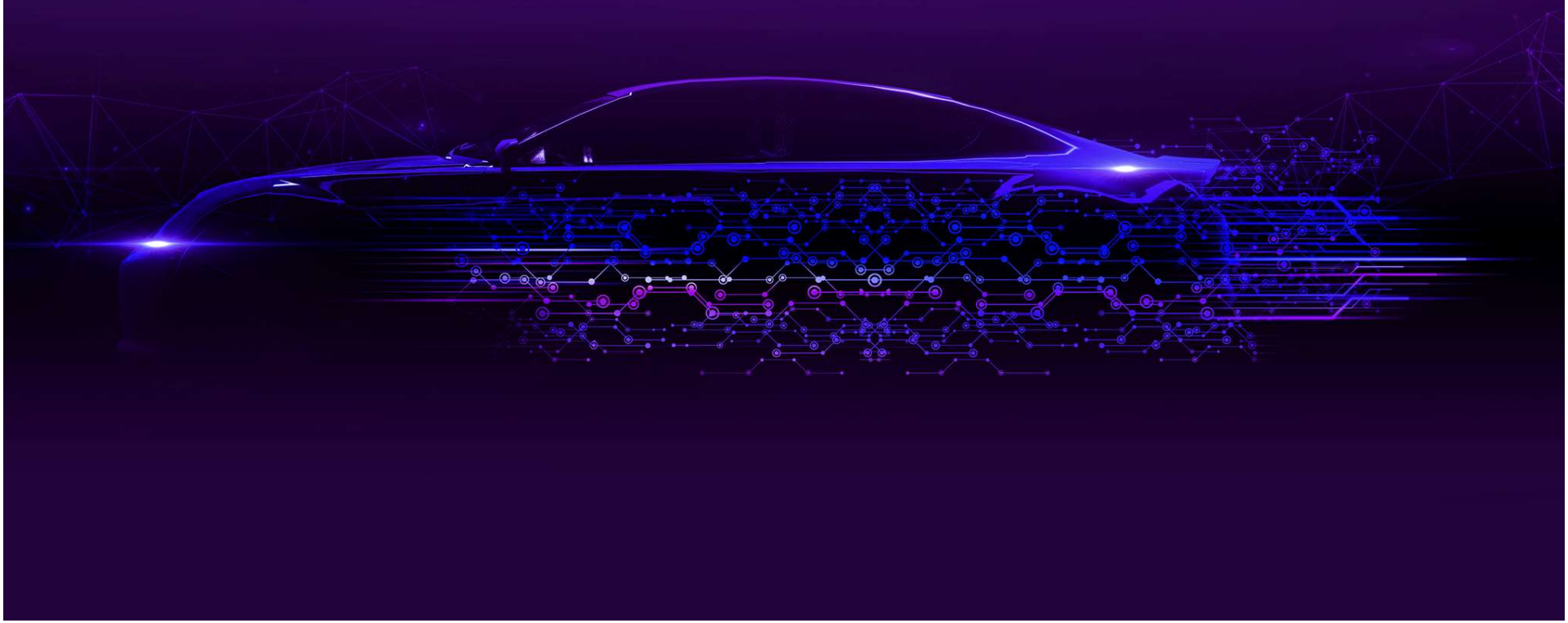
Learn More



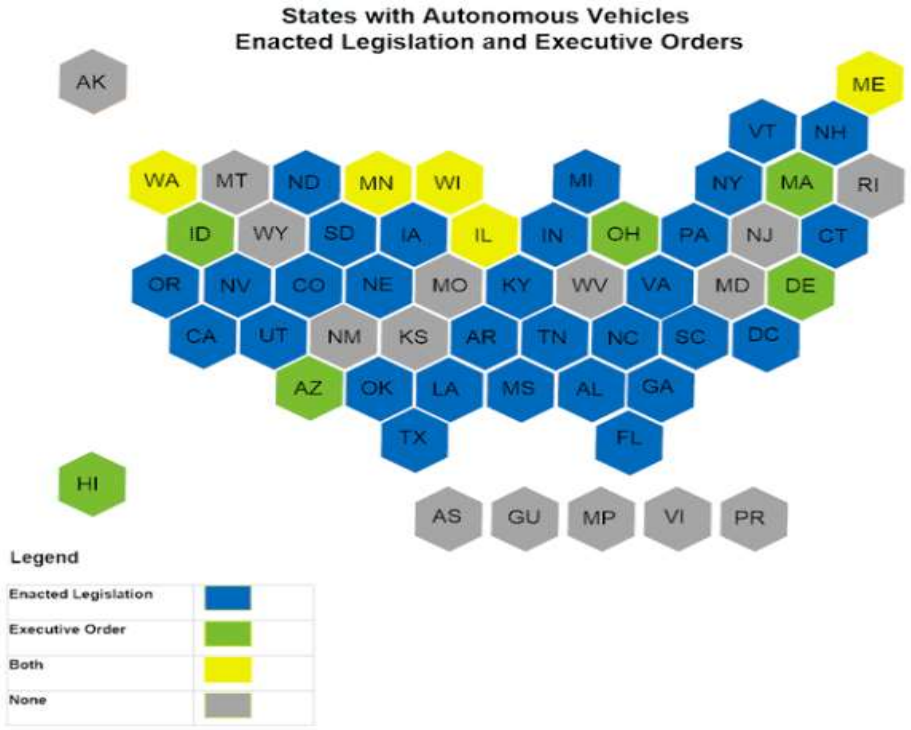
*https://www.nhtsa.gov/automated-vehicles-safety/av-test-initiative-tracking-tool

SECTION 04

STATE LEGISLATIVE AND REGULATORY ACTIVITY

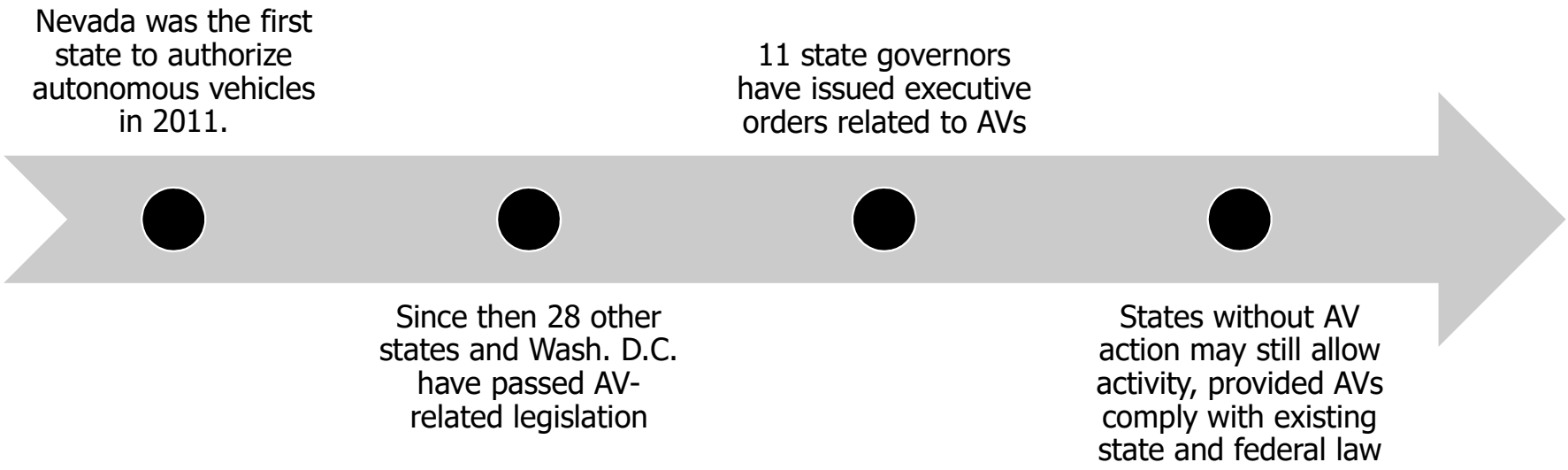


State Legislative and Regulatory Activity



https://www.ncsl.org/research/transportation/autonomous-vehicles-self-driving-vehicles-enacted-legislation.aspx (current as of 2/18/20)

State Legislative and Regulatory Activity



Nevada AV Legislation

- AB 511 (2011)
  - First state to authorize operation of AVs
  - Creates driver's license endorsement for AV operators
  - Directs DMV to adopt rules for licensing and operation
- AB 69 (2017)
  - Allows testing and operation of fully autonomous vehicles
  - Authorizes commercial use of fully autonomous vehicles
  - Requires accident reporting and extends manufacturer and developer liability immunity
  - NTA may permit and regulate AV network companies in a manner similar to TNCs

Nevada AV Activity

- Nevada: a state of firsts
  - 2011: became first state to approve AV legislation
  - 2016: issued nation's first AV-restricted driver's license to quadriplegic man
  - 2017: first fully autonomous shuttle operating on public streets in the US

- Nevada sponsoring innovation to facilitate AV testing and operation
  - Partnering with WayCare to develop platform to harness AV data
  - Las Vegas outfitting traffic signals with two-way communication devices
  - Statewide launch of vehicle-to-vehicle network for real-time driving updates

Arizona – State Legislation

- Executive Order 2015-09
  - Directing agencies to "undertake any necessary steps to support the testing and operation of self-driving vehicles on public roads in Arizona."
- Executive Order 2018-04
  - Removed requirement that safety driver be present
  - Pledges AZ to keep pace with emerging technology
  - Directs Dept. of Public Safety to work with law enforcement on first responder protocols for AVs in emergency and traffic enforcement situations
- Executive Order 2018-09 established Institute of Automated Mobility

Arizona – State-Sponsored Innovation

- Executive Order 2018-09 established Institute for Automated Mobility
  - Consortium designed to embrace innovation and collaboration in AV space
- Members from academia, public sector and global industry leaders
- State-of-the-art research, development, testing and evaluation of AV systems
- Vision for AV R&D facilities, simulation lab and infrastructure projects

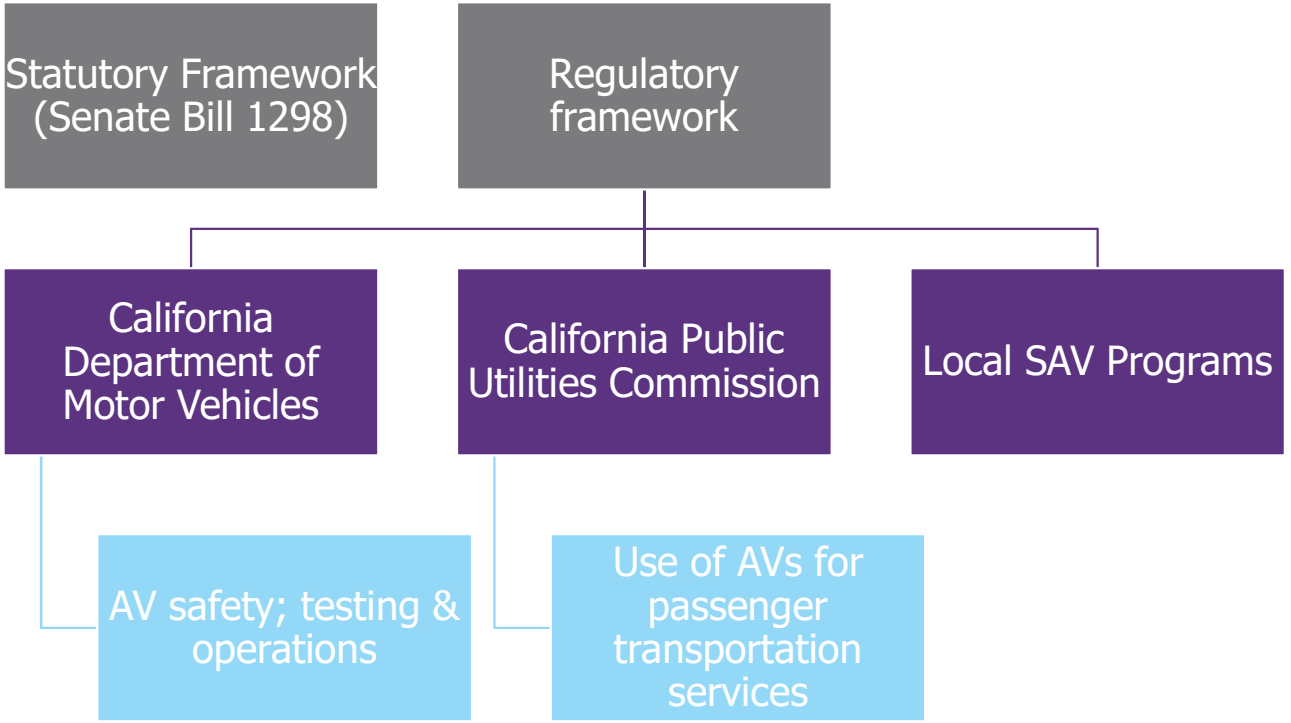
Arizona – Hotbed of AV Activity

- Advertises light touch regulatory approach
  - "Where self-driving cars go to learn" – *New York Times*
  - "[P]roving ground for this transformative technology" – AZ Commerce Authority

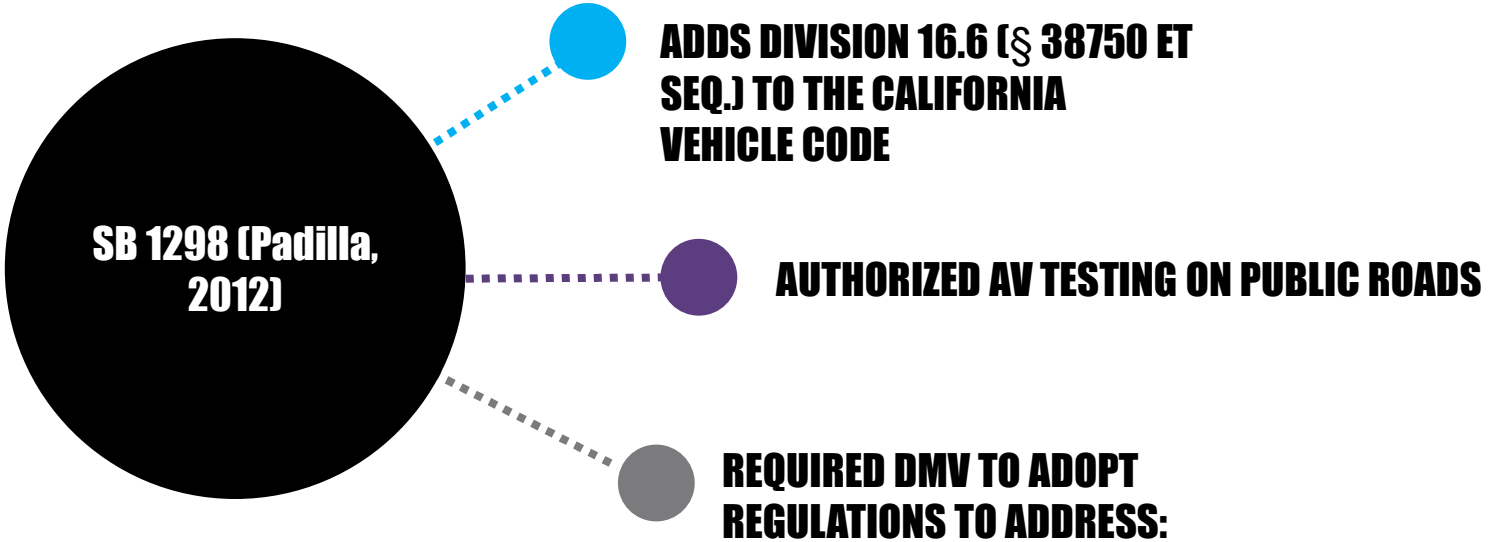
- First state to:
  - Enact executive order supporting testing and operation
  - Allow commercial self-driving taxi service (launched by Waymo in various cities)

- 600+ vehicles and more than a dozen companies testing on public roads

Deep Dive: California



California Legislation



California Regulatory Framework

- **DMV Regulations (Cal. Code Regs., tit. 13 §§ 227 *et seq*.)**
  - Adopts SAE classification system: levels 3-5 qualify as AV
  - Authorizes public passenger transport in test vehicles, *without compensation*
  - Provides for separate permits for **testing** and **deployment** of **drivered** and **driverless** vehicles
  - Manufacturers only
  - $5 million in insurance required for either program
  - Prohibits AV trucks (> 10,000 lbs) and motorcycles

California Testing Programs

DMV "Autonomous Vehicle Tester Program"

- Established in 2014
- Stringent test driver requirements
- Requires reporting of unanticipated disengagements of autonomous technology annually
- Two year term
- Manufacturers must identify specific test vehicles and describe technology
- Currently 60 manufacturers hold testing permits

DMV "Autonomous Vehicle Tester (AVT) Driverless Program"

- Established in 2018
- Notify local authorities in writing
- Remote operator with two-way continuous communication link
- Maintain training program with remote operators
- Require reporting of unanticipated disengagements of autonomous technology annually
- Establish means of communication with third parties in event of collision
- Provide law enforcement interaction plan
- Currently four permit holders: Waymo, Nuro, Zoox, and AutoX

California Public Utilities Commission

Decision 18-05-043

- CPUC authorized two pilot programs for AV passenger transport
  - "Drivered AV Passenger Service"
  - "Driverless AV Passenger Service"
- Must possess parallel DMV permit for drivered or driverless operation
- Restricted from collecting fares and passengers must provide explicit consent
- Quarterly trip data submission
  - Miles traveled, idle time, occupancy, accessible ride data
- "Driverless" entities must record remote operator/passenger interactions and retain for one year
- Currently 7 "Drivered" AV Permits issued; No "Driverless" AV Permits Issued
  - Zoox, AutoX, Pony.ai, Waymo, Aurora Innovation, Cruise, Voyage

California Local SAV Projects

- SAVs - Shared Autonomous Vehicles
- Bishop Ranch – San Ramon SAV Project
  - Shared autonomous vehicle testing at business park in San Ramon, CA
  - On hold pending NHTSA certification of new SAV models
    - Testing currently taking place at local AV testing facility
- Livermore Amador Valley Transit Authority SAV Project
  - On-street testing began in June
  - SAVs hold up to 6 passengers, travel at 13 MPH and must have an operator at all times
  - Provide reliable, safe and eco-friendly transport between bus routes and BART

Michigan AV Legislation

SB 169 (2013)

- Testing of driverless cars on roads and highways

SB 995 (2016)

- Open operation of CAVs beyond testing
- On-demand AV networks link passengers to transportation options
- AV platoons on roadways

HB 5406 (2018)

- Established State Infrastructure Council to collect data on infrastructure systems
  - Create database to inform strategy for investment and management

Executive Directive 2020-1

- Created Michigan Office of Future Mobility
  - Coordinating investment, infrastructure development, manufacturing, startup grants

Michigan AV Developments

- State of the art infrastructure
  - 500+ miles of roadway equipped for CAV testing
- Manufacturing hub
  - 18 OEMs and 60 of the top 100 automotive suppliers headquartered in Michigan
- State funding
  - Earmarked $20 million in 2019 for investment in mobility initiatives and startups
- Partnering with tech and auto companies to retrofit 40 miles of roads exclusively for AVs
  - Includes installation of cameras, sensors and barriers
  - Private funding for retrofit and public funds for maintenance

Florida AV Legislation

- CS/HB 311 (2019)
  - Driverless AVs allowed on public roads (SAE 4-5 only)
  - Passengers exempted from laws against texting or other distracted driving activities
  - Ride-sharing companies must provide at least $1 million in liability insurance
  - No state inspection or certification required to operate
  - Cars must be equipped with safeguards to achieve "minimal risk condition"
    - Pull over and activate hazard lights
- Gov. Ron DeSantis
  - "With this bill, Florida officially has an open-door policy to autonomous vehicle companies, and I encourage them to relocate from California to Florida"

Texas AV Legislation

- SB 2205 (2017)
  - Preempts previous local regulation
  - Driverless vehicles can operate on public roads throughout state
  - Equipped with video recording devices and proper insurance
  - Manufacturer liable for accidents or violations, provided AV system has not been modified
- TX DOT creating CAV Task Force
  - Coordinate CAV efforts across the state
  - Compile data, host industry forums and shape future state legislation

Pennsylvania AV "Legislation"

Pennsylvania law does not explicitly regulate AV testing

- As a result, localities control AV regulation

Pittsburgh has become a hotbed for AV testing

- Friendly regulatory climate and local gov. incentives
- Aptiv, Argo AI, Aurora Innovation and Uber test in the city

HB 1958 (2018) is closest PA gets to AV regulation

- Established regulations on truck "platooning"
  - Group of vehicles operated by humans traveling at electronically coordinated speeds
- Defined "highly automated work zone vehicle"
  - Received $60m in federal grants for research on safe integration of AVs in work zones
- Created "Highly Automated Vehicle Advisory Committee" to report on AV activity in state

SECTION 05

UPCOMING & RECENT STATE DEVELOPMENTS

Upcoming & Recent State Developments

- California
  - Considering AB 3116
    - Could authorize "mobility device" operators (including AVs) to submit anonymized trip data to a regulatory entity
    - Trip data can be shared if it is to assist the public agency in the promotion and protection of transportation planning, integration of mobility options, and road safety, etc.
  - CPUC to Issue Decision on AV Regs (Proposed Decision expected soon)
- Alabama considering SB 229
  - Amend AL code to add State Law Enforcement Agency to DOT as an AV approver
  - Proposes DOT must approve all routes used by commercial AVs

Upcoming & Recent State Developments

- Hawaii passed HB 2590 on September 15
  - Establishes AV pilot program
  - Testing allowed on any public road with "conventional human driver" present
- Minnesota Hosting Connected and Automated Vehicles Virtual eSummit on October 22
  - Brings together 10 Midwestern states comprising the Mid-American Association of State Transportation Officials (MAATSO)
  - Focused on developing a 10-year regional strategy

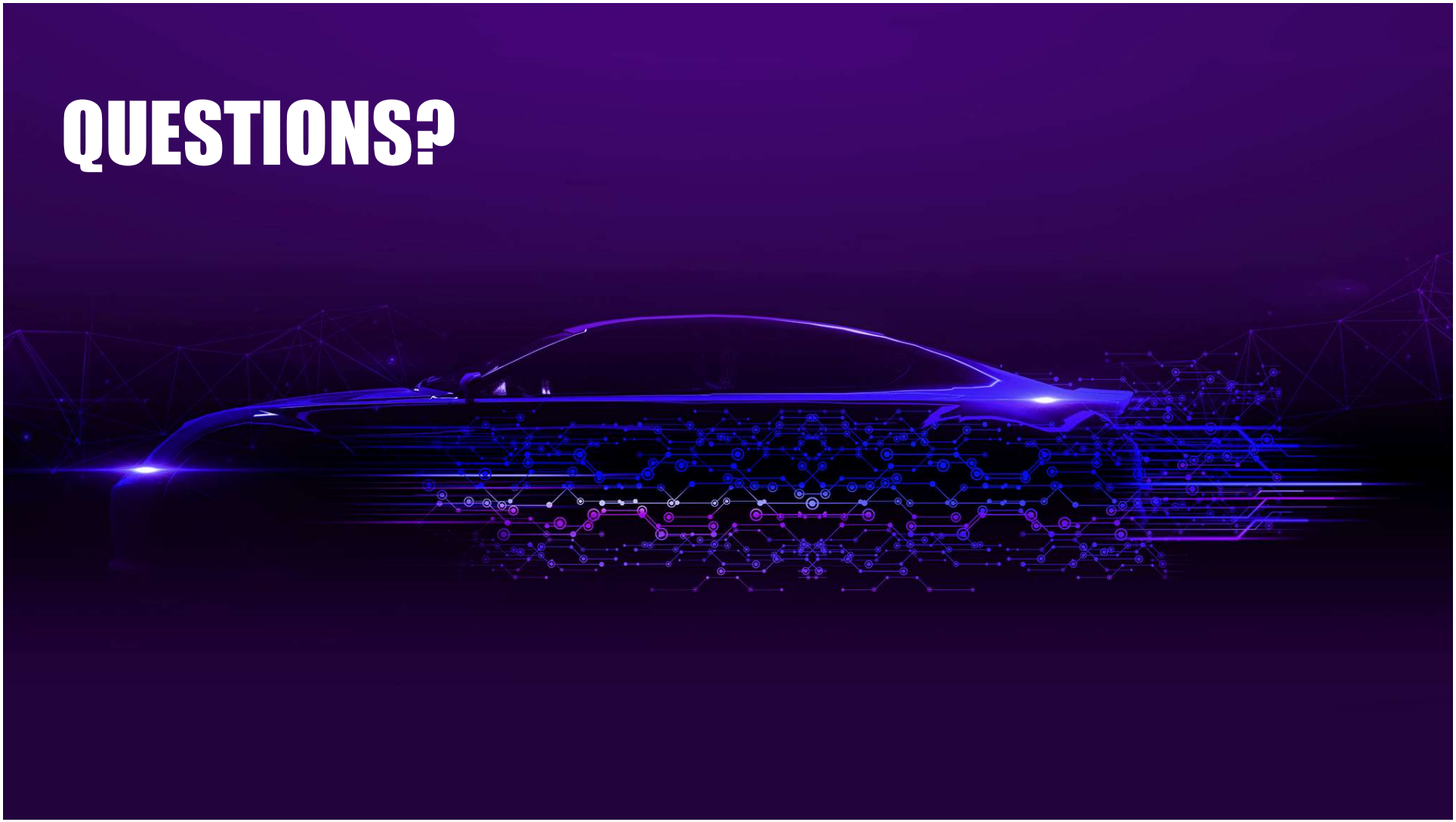
SECTION 06

KEY TAKEAWAYS

Key Takeaways

- Currently no comprehensive national AV legislation
- AV testing and service varies by State and local jurisdiction
- Fully Driverless still developing
- Jurisdictions experimenting with various AV applications and technologies
- Full commercialization increasingly important

QUESTIONS?



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