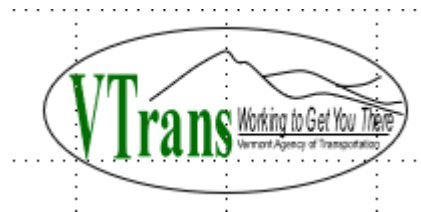


PREPARING FOR AUTOMATED VEHICLES IN VERMONT

2019 Vermont Municipal Day Training

Joe Segale, P.E./PTP.

Policy, Planning & Research Bureau Director



PRESENTATION

- Automated Vehicles Overview
- Potential Benefits and Consequences
- Federal and State Roles
- VT AV Testing Act
 - State and Municipal Roles



CAMERAS

Stereo and infrared camera data helps avoid obstacles, identify road sign messages, and visualize lane markings.

SOFTWARE

On-board computers run advanced software to analyze data collected by sensors to make intelligent maneuvers and real-time route determination.

RADAR

Radar tracks nearby objects, which helps maintain the car's distance from vehicles ahead and detect blind spot obstacles.

LIDAR

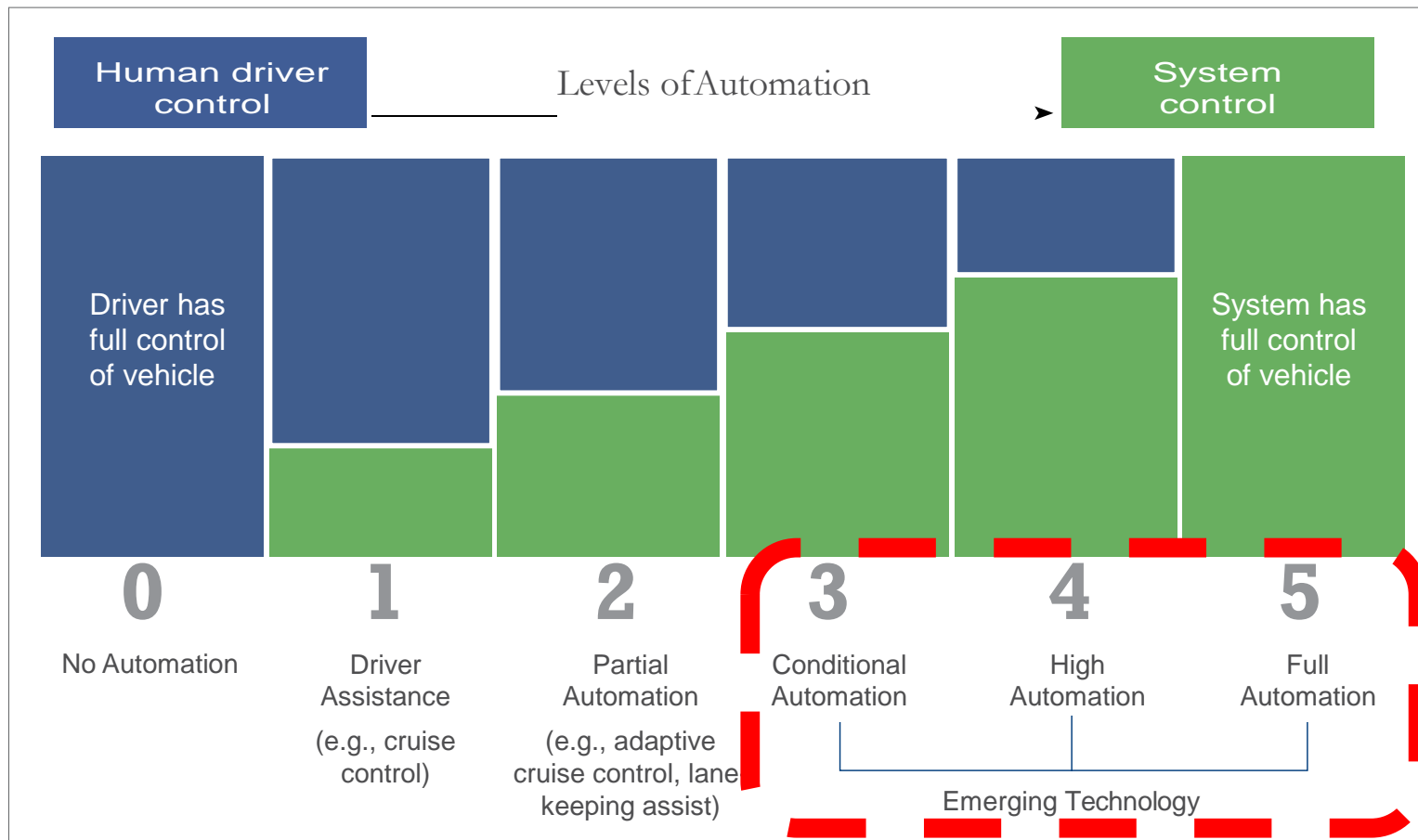
Light detection and ranging system generates a point cloud that gives the car a 360-degree view.

DEDICATED SHORT RANGE COMMUNICATION

Provides communication between vehicles (Vehicle to Vehicle - V2V) and between vehicles and the transportation infrastructure (Vehicle to Infrastructure - V2I). DSRC is expected to be utilized where existing Intelligent Transportation Systems (ITS) are already in place, such as urban areas, high volume limited access facilities, and managed lanes.



AUTOMATED VEHICLE TESTING ACT



**AV TEST PERMIT REQUIRED
FOR VEHICLES WITH
LEVEL 3-5
AUTOMATED DRIVING
SYSTEMS**

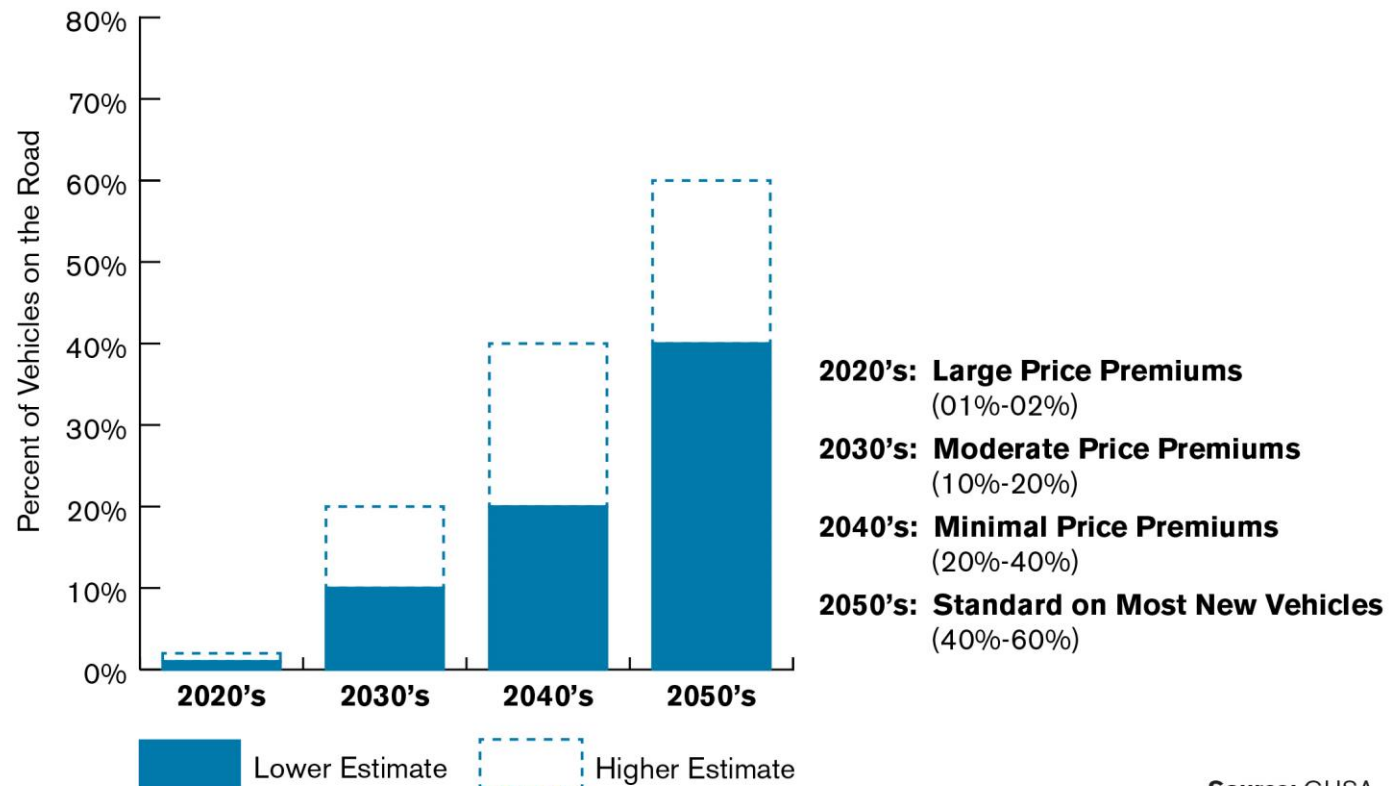
SOURCE: Liberty Mutual "Automated Vehicles: Changing Role of the Driver"

AUTOMATED VEHICLES ON THE ROAD

(CONSERVATIVE FORECAST)

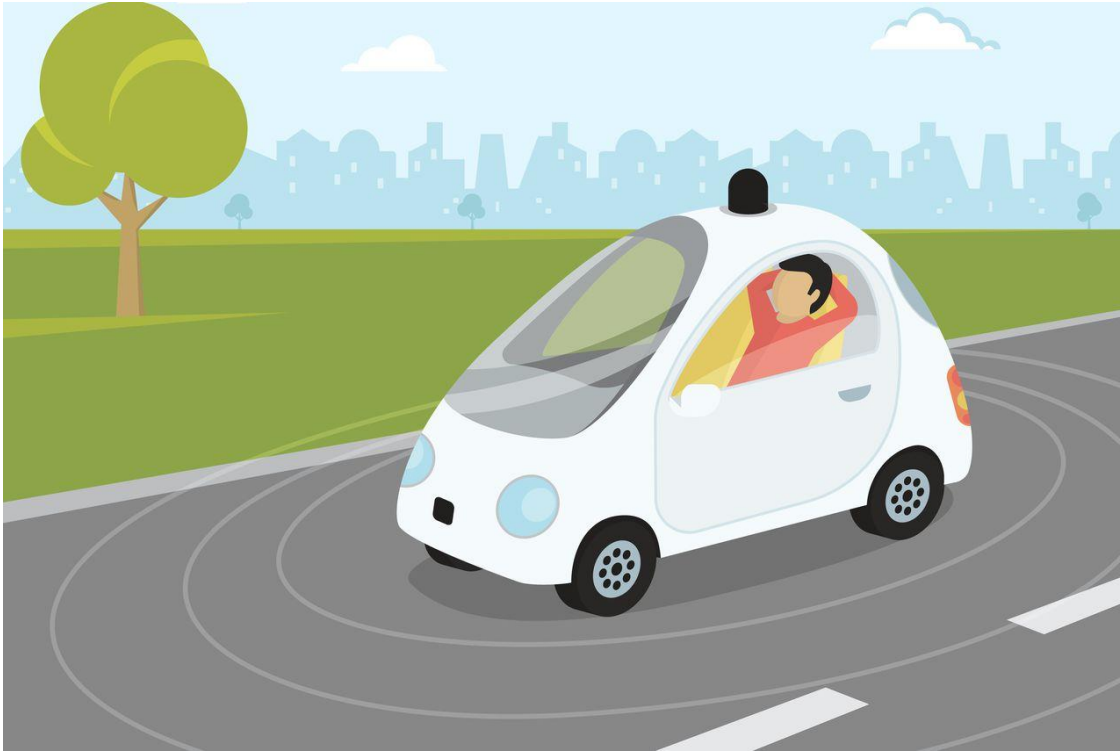
Autonomous Vehicle Fleet Projections

(as a percentage of all vehicles on the road)



IMPACTS DEPEND ON OWNERSHIP MODEL

Individual Ownership



Shared Ownership & Mobility as a Service



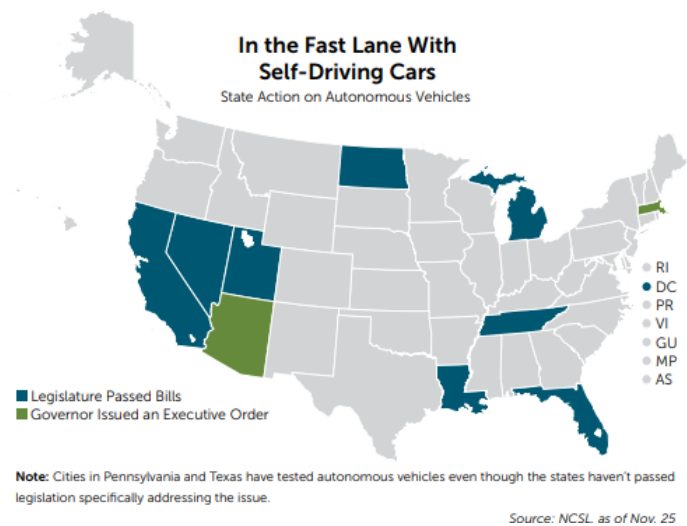
FEDERAL AND STATE ROLES

Federal (NHTSA) Role	State Role
<ul style="list-style-type: none">• Set Federal Motor Vehicle Safety Standards (FMVSS)• Ensuring compliance with FMVSS• Investigating & managing recalls• Communicating & educating the public on motor vehicle safety issues• Issuing guidance for vehicle and equipment manufacturers to follow	<ul style="list-style-type: none">• Operator licensing• Operator education & training• Vehicle registration• Regulate motor vehicle insurance and liability• Vehicle safety inspection• Establish & enforce traffic laws*• Build and operate infrastructure*

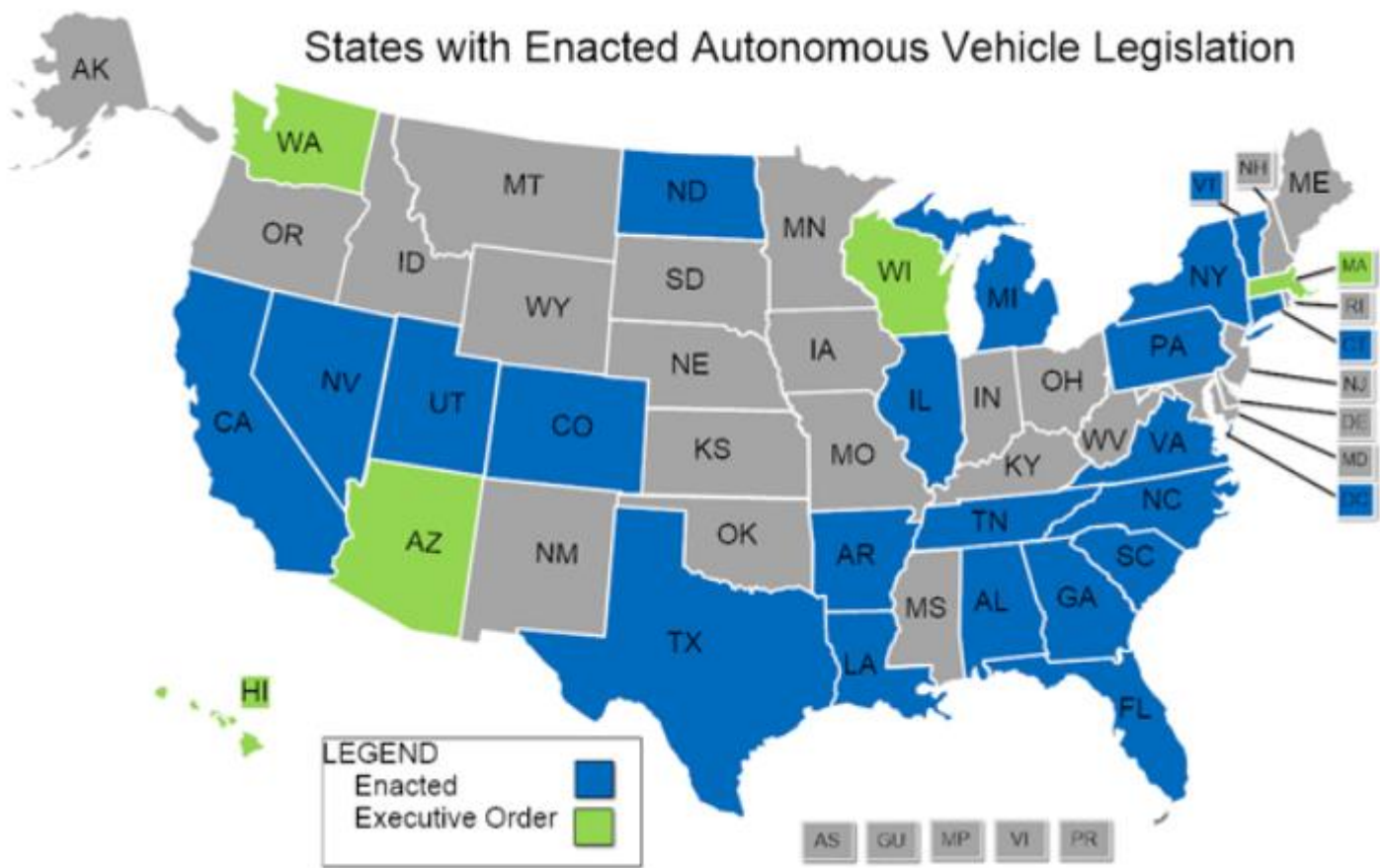
* Municipalities also establish and enforce traffic laws, build and operate infrastructure

STATE LEGISLATION

Nov. 2016



Feb. 2018



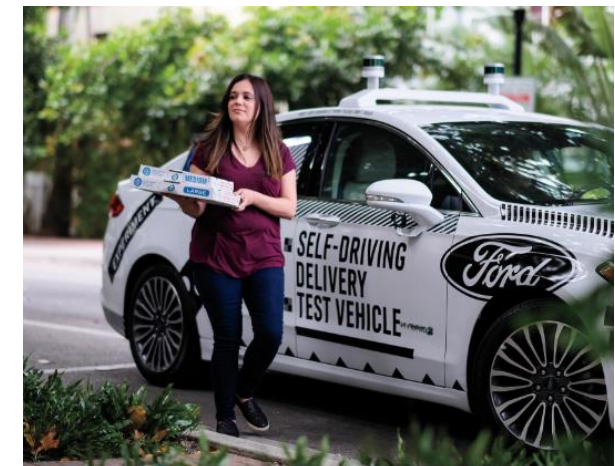
SOURCE: National Conference of State Legislatures

WHY ALLOW TESTING ON VT ROADS?

- Facilitate deployment in VT
- Build public confidence
- Provide clear process for testers
- Provide a publicly transparent process that facilitates safe testing



WHAT WOULD A TEST LOOK LIKE?



AV TESTING ACT APPROVAL PROCESS

TRAFFIC COMMITTEE HAS SOLE AUTHORITY TO APPROVE, MODIFY OR REVOKE AV TESTING PERMITS

State Roles and Responsibilities	Municipal Roles and Responsibilities
<ul style="list-style-type: none">• State can approve testing on all state highways and Class 1 Town Highways• VTrans must develop testing application guide by January 2021• In consultation with RPCs, VTrans must identify municipalities that have “pre-approved” testing• VTrans must maintain list of municipalities that have pre-approved testing in testing application guide	<ul style="list-style-type: none">• Municipal approval required if testing involves Class 2, 3 and 4 Town Highways• Municipalities will be asked to pre-approve testing• Municipalities can withdraw approval at any time• Municipal approval of specific testing permits not required• Municipalities can not approve testing on Town Highways without Traffic Committee approval• Municipalities are not responsible for modifying roadways or other infrastructure to accommodate a test, or for any costs related to conducting the test.
<ul style="list-style-type: none">• Any state or local law enforcement officer may stop a specific AV test vehicle due to permit condition violation or if there are safety concerns	

ACT 60 AV TESTER REQUIREMENTS

- Human operator required in driver seat and must be able to take physical control of the vehicle
 - Operator must be at least 21 years old
 - Operator must pass a background check
 - Blood alcohol content less 0.02
- \$5 Million Liability Insurance
- Vehicle must be able to comply with all state and local traffic laws
- AV Testing Vehicle must be clearly identifiable



TESTING APPLICATION GUIDANCE

Vermont Automated Vehicle Testing Permit

GUIDANCE AND APPLICATION



Date
Working Draft

- Experience with Autonomated Vehicles
- Applicant's Voluntary Safety Self-Assessment
- Testing Plan
- First Responders Interaction Plan
- Summary of Training and Operations Protocol
- Motor Vehicles in Testing Program
- Drivers in Testing Program
- Insurance Requirement
- Additional Questions

NEXT STEPS

- **Recruit AV Testing Municipalities**
 - Develop Municipal Approval Form Template
 - Meet with RPC TACs/Commissions to Spread Word
 - Follow-up with Interested Municipalities
- **Complete AV Testing Guidance and Permit Application**
- **In partnership with interested stakeholders, explore AOT Lead AV Pilot**

Questions?