

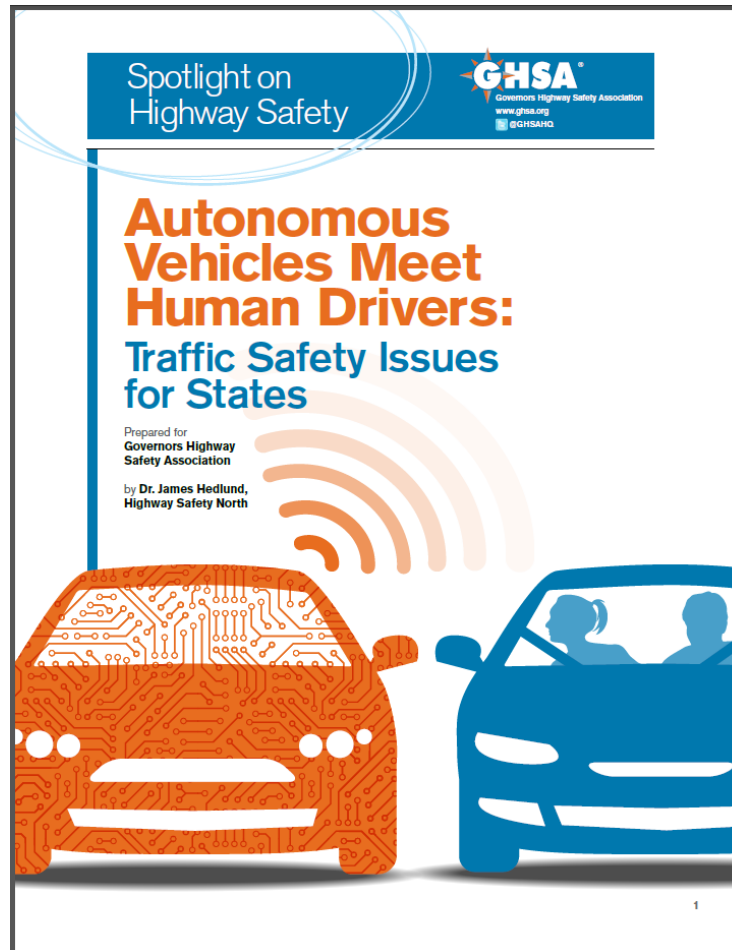
# Autonomous Vehicles Meet Human Drivers: Traffic Safety Policy Issues for States

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# Today

- **Background**
  - What's an autonomous vehicle (AV)?
  - What's on the road now?
  - What's coming and when?
  - What does the public think about AVs?
  - What are current state laws on AVs?
- **Policy issues for states: discussion**
  - AV testing
  - AV operations
- **What can states do now (and what shouldn't they do)?**

# What's an AV?

- **Level 0: no automation, driver in complete control**
- **Level 1: driver assistance**
  - Cruise control or lane position, driver monitors at all times
- **Level 2: occasional self-driving**
  - Control both speed and lane position in limited situations, like Interstates; driver monitors at all times

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- **Level 3: limited self-driving in some situations, like Interstates**
  - Vehicle in full control, informs when driver must take control
- **Level 4: full self-driving under certain conditions**
  - Vehicle in full control for entire trip, such as urban ride-sharing
- **Level 5: full self-driving at all times**
  - Cruise control or lane position

# What's on the road now?

- **Level 1 available for many years**
  - Cruise control, electronic stability control, lane-keeping assistance
- **Level 2 available now**
  - Tesla Autopilot
- **Level 3-5 being tested extensively**
  - Google test fleet: 2 million miles
  - Uber in Pittsburgh
  - 33 companies worldwide working on some aspect of AVs

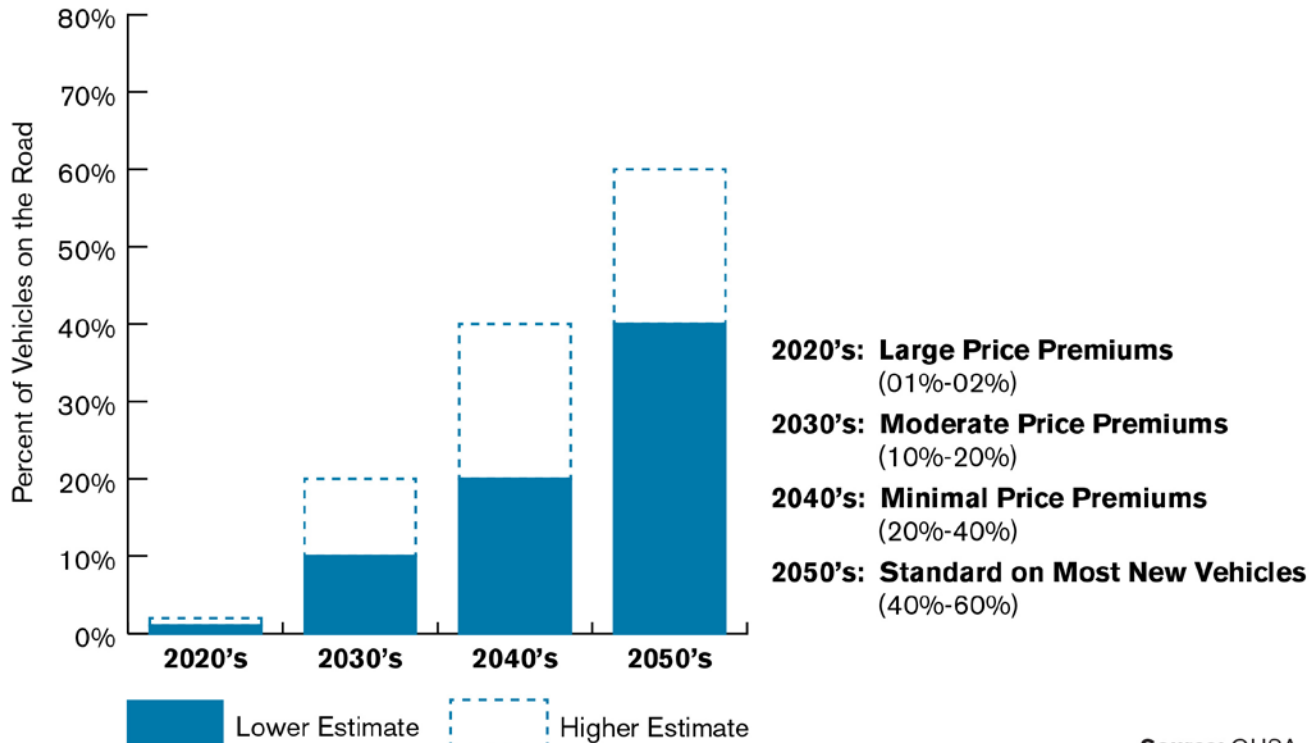
# What's coming and when?

- **Level 3-5 vehicles available commercially in 3-5 years**
  - Tesla – current Autopilot has Level 5 software
  - Volkswagen – predicts 2019
  - GM, Toyota – predict 2020
  - Ford – predicts 2021

# What's coming and when?

## Autonomous Vehicle Fleet Projections

(as a percentage of all vehicles on the road)



# What does the public think about AVs?

- **Skeptical**

- Prospect of wide use? 34% excited, 57% worried
- Will AVs reduce crashes? 35% yes, 46% no
- Would you ride in an AV today? 17% yes, 75% no
- Would you buy an AV when available? ≈ 20% yes, ≈ 50% no

- **Prefer AVs that allow drivers to take control**

- Over 80% in two surveys

5 surveys (4 in 2016 and 1 in 2015), 4 in US and 1 in Canada



# What are current state laws?

- **AVs probably can operate in most states without law changes**
- **AV laws in place in 9 states and DC**
  - CA, DC, FL, NV: testing and operations
  - MI, UT: testing
  - LA: defines AV, ND authorizes a study, TN establishes certification, VA allows viewing a visual display in autonomous mode
- **AV executive orders in 2 states**
  - AZ executive order: testing and operations
  - MA executive order: testing

# State AV policy issues - testing

## Encourage AV testing while protecting public safety

- **Final testing is on public roads**
- **Some considerations**
  - Must testing organizations apply to the state
  - How and where will testing be conducted
  - Test driver selection and training
  - Test vehicle identification
  - Testing organization's safety culture and safety plan
  - Testing organization's insurance
  - Reporting: test trips, incidents, crashes, injuries

Most topics are suggested in NHTSA's AV Policy

# State AV policy issues - operations

## Encourage AV operations while protecting public safety

- **AV certification**
  - Proper operation when all systems working properly
  - Plan to deal with hardware or software failures
- **AV registration and titling**
  - Identify Level 3-5 AVs in title and registration
  - Identify AV level
  - For Level 3-4 AVs, identify where AV can operate autonomously (Operational Design Domain)
- **AV drivers**
  - Licensing and training for Level 3-4 AVs

# State AV policy issues - operations

## Encourage AV operations while protecting public safety

- **Laws on AV operations**

- Who's the driver
- Distracted driving laws
- DUI and DUID laws
- AVs and traffic laws – speed limits, following too closely

- **Law enforcement**

- How to identify AVs
- Traffic stops; vehicle pursuit
- Officer safety
- Road rage of human drivers interacting with AVs
- AVs suspected of carrying contraband

# State AV policy issues - operations

## Encourage AV operations while protecting public safety

- **Crash investigation**
  - How to identify AVs
  - Officer and emergency responder safety
- **Data systems**
  - How to identify AVs in vehicle title and registration, driver licensing, crash reports
- **Liability and insurance**
  - Who is liable – manufacturer, software provider, owner, operator
- **Vehicle inspection, for states with periodic safety inspections**
- **Coordination across states**

# What should states do – big picture

- **Be informed; stay informed**
- **Be a player**
  - Join or start a state AV task force
  - Work with other states to develop consistent laws, policies, procedures
- **Understand state roles**
  - Federal role: regulate vehicles
  - State roles: license vehicles and drivers, establish and enforce traffic laws, vehicle insurance and liability
- **Don't rush to establish AV laws or regulations**
  - Aim for consistency across states
- **Be flexible**
  - AVs are disruptive technology, developing very quickly

# What should national organizations do?

- **Develop model AV laws and regulations**
- **Document the traffic safety issues of AVs**
- **Develop model public education materials**
- **Establish an AV information clearinghouse**
- **Issue vehicle regulations and guidance promptly**
- **Establish regulations or guidelines to identify AVs easily**
- **Involve law enforcement, SHSOs, and DMVs in AV discussions**

# For more information

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**Download the report: [www.GHSA.org](http://www.GHSA.org)**