

Automated Vehicle Safety: Engaging Drivers and Law Enforcement

Webinar Wednesday, October 16, 2019 1:00 pm
Jim Hedlund, Highway Safety North



In the next 30 minutes

- **The expert panel: why, who, what it did**
- **Brief background on AVs**
- **AV challenges**
- **Panel's conclusions**
- **Panel's recommendations**

The expert panel

- Reasons for forming a panel
- Members of the panel
- Goals of the panel

Panel background: Why

- **AVs are coming, some shuttles already operating**
- **Public lacks good information about AVs**
- **AV messaging often misleading or inaccurate**
- **Many states and law enforcement agencies not prepared for AVs**

Panel background: Who

- **Expert panel met May 8 in Washington**
 - Federal government: NHTSA, FMCSA
 - States: SHSOs, AASHTO, AAMVA
 - Auto manufacturers
 - Lyft and Uber
 - Insurance
 - Law enforcement, criminal justice: IACP, NSA, NDAA
 - Traffic safety groups
 - Communications experts

Panel background: What

- **Panel goals: for states, law enforcement, and criminal justice**
 - Document the key issues AVs raise
 - Recommend what to do to prepare for AVs
- **White paper summarizing the panel's discussion and recommendations released August 6**

Automated Vehicle Safety Expert Panel: Engaging Drivers and Law Enforcement

Available from GHSA

Brief background on AVs

- What's an AV?
- How an AV works
- AV status in 2019
- AV deployment projections

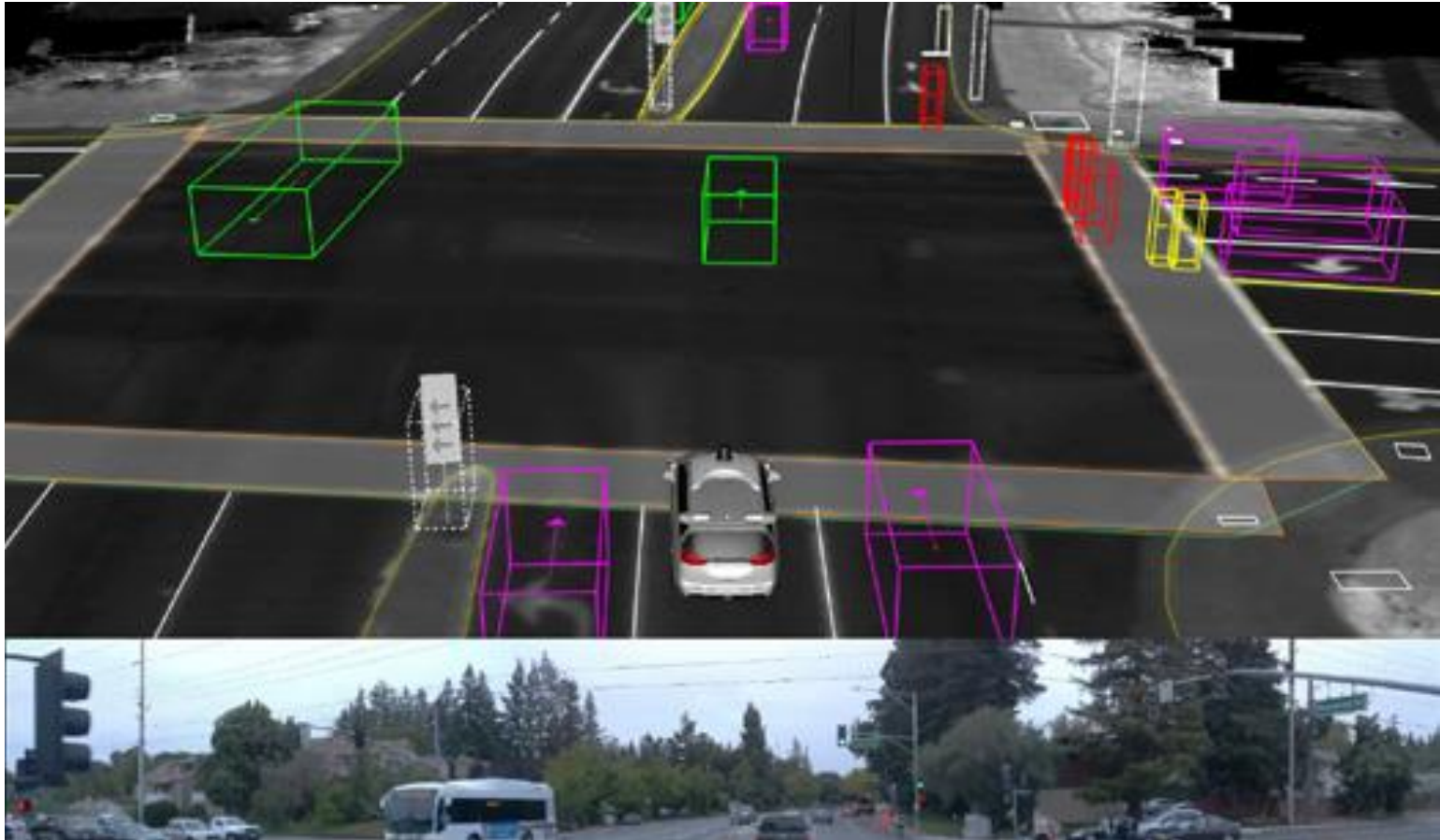
What's an AV?

- **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
- 1-2: Advanced Driver Assistance (ADAS); 3-5: Highly Automated (HAV)**
- **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**

The AV begins with a map



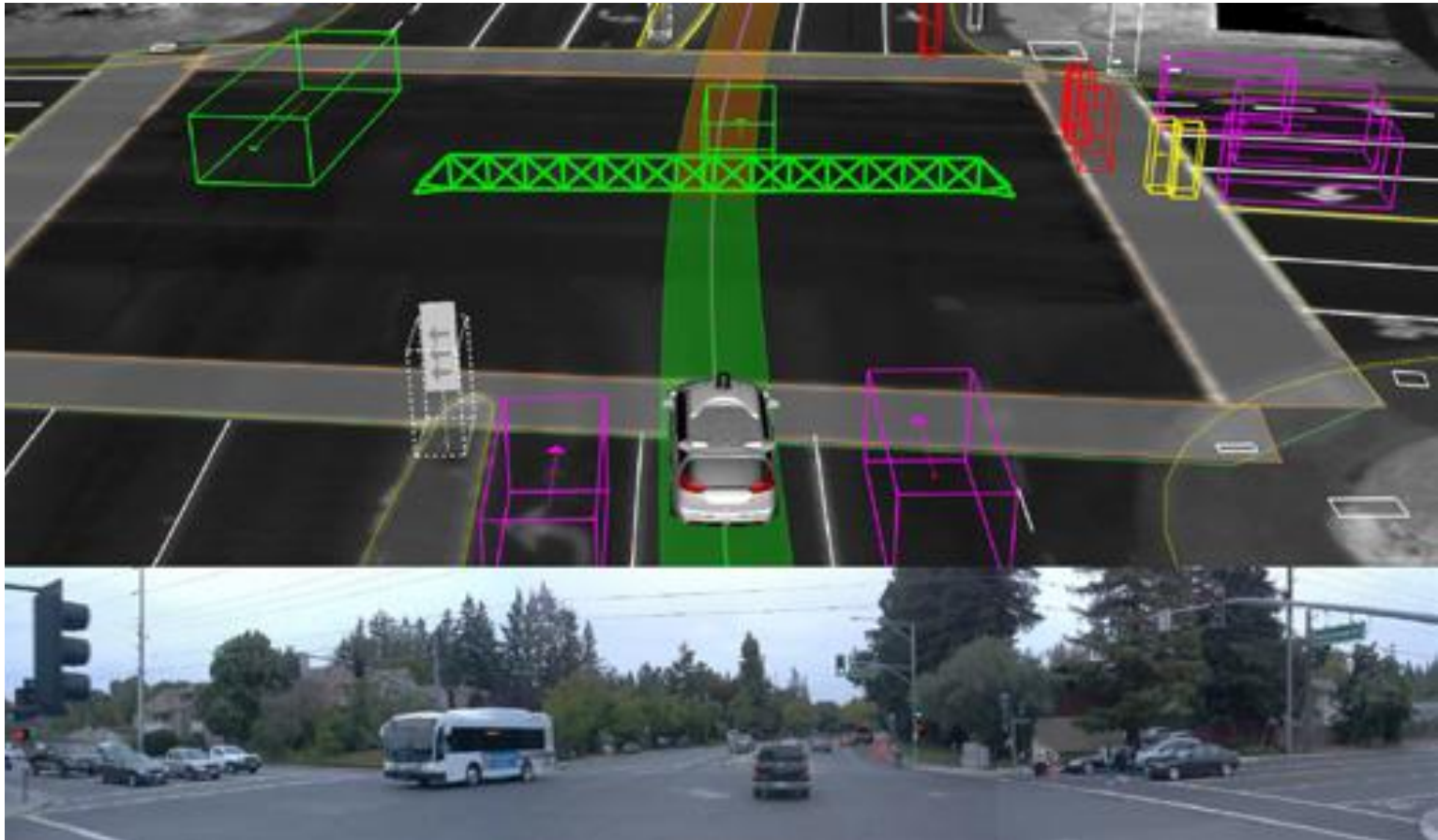
Senses what's around it



Predicts where things will move



And chooses route and speed



AV status 2019

- **Level 1 available for many years**
 - Adaptive cruise control, lane-keeping assistance
- **Level 2 available now**
 - BMW, GM, Mercedes, Tesla, VW, ...
- **Levels 3-5 coming soon**
 - Waymo (Google) test fleet: 10 million miles as of October 2, 2019; another million miles every 40 days
 - 64 companies with AV testing permits in CA as of August 2019; 201 crashes as of October 10, 2019
 - By 2020: available (perhaps) from Audi, BMW, Ford, GM, Mercedes, Tesla, Toyota, Volvo, VW; Delphi, FCA, JLR, Lyft, NuTonomy, Uber, Waymo, ...

AV status 2019

- **15 states and DC authorize on-road AV testing;
10 states authorize deployment**
- **Extensive testing or deployment in at least 12 states**
- **AV shuttles operating in at least 9 states**

Colorado

New York

Florida

Ohio

Maryland

Rhode Island

Michigan

Virginia

Nevada

AV projections

FIGURE 5: PREDICTIONS OF SALES, VEHICLES ON THE ROAD, AND TRAVEL FOR LEVEL 4 AND 5 VEHICLES

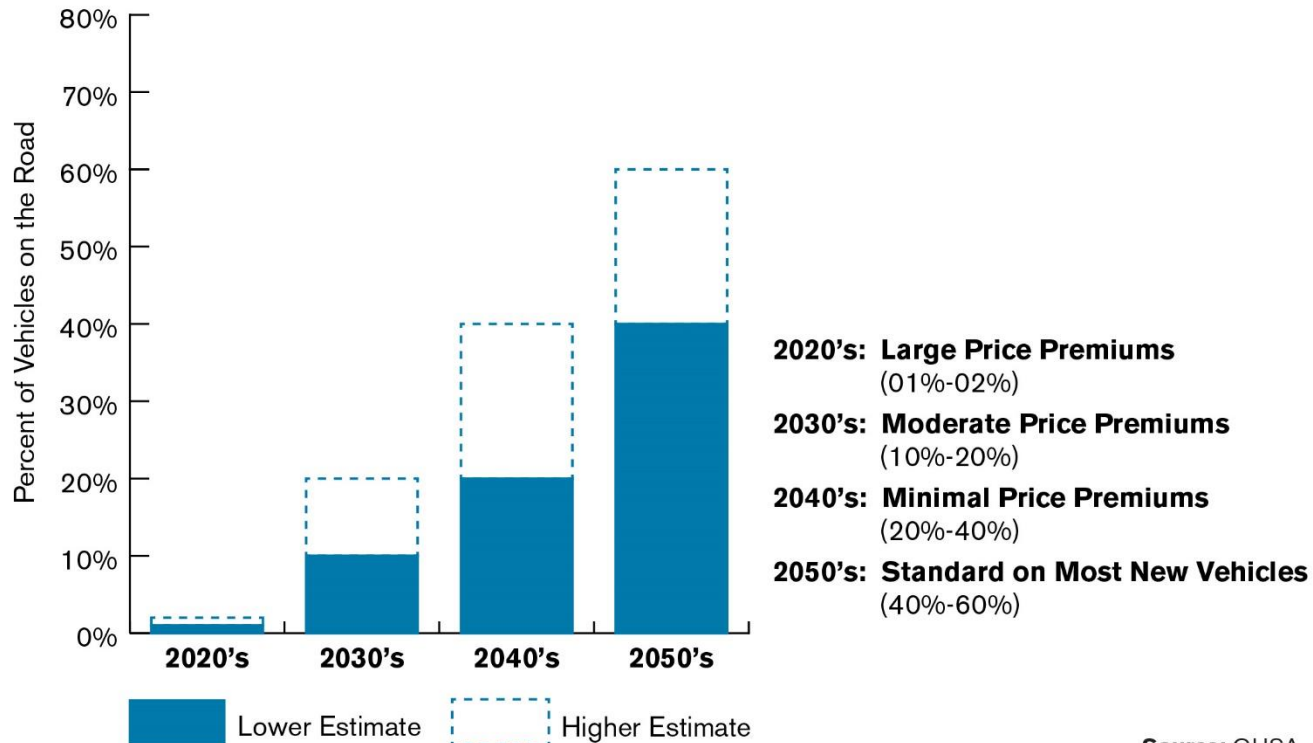
Stage	Decade	Vehicle Sales	Vehicle Fleet	Vehicle Travel
Large price premium	2020s	2-5%	1-2%	1-4%
Moderate price premium	2030s	20-40%	10-20%	10-30%
Minimal price premium	2040s	40-60%	20-40%	30-50%
Standard feature on most new vehicles	2050s	80-100%	40-60%	50-80%
Saturation (everybody who wants it has it)	2060s	?	?	?
Required for all vehicles on road	???	100%	100%	100%

Source: Littman (2018)

AV projections

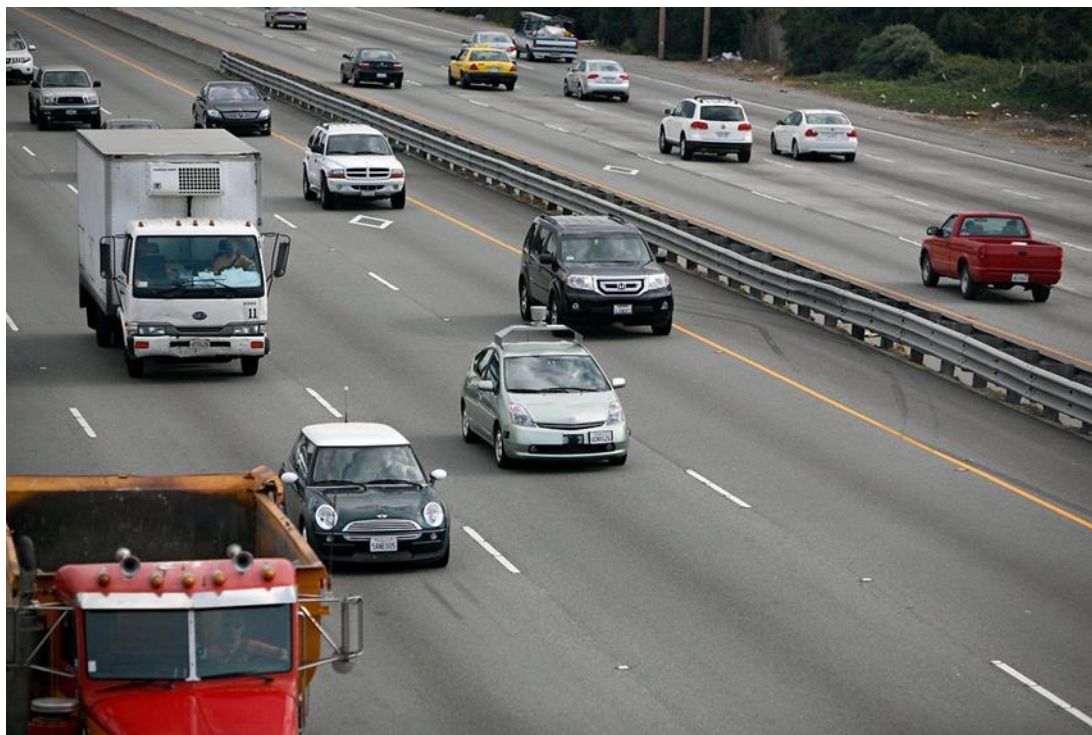
Autonomous Vehicle Fleet Projections

(as a percentage of all vehicles on the road)



The big takeaway

- **AVs and DVs (driver-controlled vehicles) will share the road for a long time – perhaps forever**



AV challenges

- For overall policy
- For states
- For the public
- For law enforcement

Policy challenge: new roles

- **Traditional**

- Vehicle is a piece of hardware; changes slowly if at all (except wear and tear)
- Driver completely responsible for operation
- NHTSA regulates vehicles: FMVSS, defects
- States regulate drivers: licensing, traffic laws and enforcement, liability

- **Level 5 AVs**

- Vehicle is both hardware and software; can change overnight
- Vehicle completely responsible for operations; no driver
- NHTSA still regulates hardware
- Who regulates software?

Policy challenge: new roles

- **Level 2-4 AVs**
 - Vehicle is both hardware and software; can change overnight
 - Vehicle and driver responsible for operations, sometimes jointly (Level 2), sometimes passing back and forth (Level 3 and perhaps 4)
 - NHTSA still regulates hardware
 - Who regulates operations?

State policy challenges

- **Regulations for AV testing and deployment**
- **How to achieve consistency across states**
- **How to educate the public about AVs**

Public challenges

- **Limited knowledge of AVs: levels, compliance with traffic laws**

Current AVs	Human drivers
Obey all traffic laws	Violate traffic laws daily
Strictly obey speed limits	Often exceed speed limit
Come to a complete stop at a stop sign	Often “roll through” stop signs

- **Need accurate and consistent information**

Law enforcement challenges

- **Identifying AVs on the road**
- **Communicating with AVs on the road**
- **AVs and traffic laws**
- **Access to AV data**
- **Crash reporting**
- **Crash liability**

Expert panel conclusions

- The two most important ones

Broad conclusions

- **AV issues are complex**
- **Addressing them will require**
 - Clear, accurate, and honest information on AVs
 - Consistency across states on AV laws and regulations
 - Consistency across AV developers on how AVs operate
 - Cooperation to produce needed information, performance standards, and training

Expert panel recommendations

- For State Highway Safety Offices (SHSOs)
- For law enforcement and EMS
- For GHSA

For SHSOs & GHSA

- **Promote AV technologies –
Highly Automated Vehicles (HAVs) and
Advanced Driver Assistance Systems (ADASs)**
- **Help develop a toolkit or library of AV information
and messages agreed on by all stakeholders**
- **Continue to address current behavioral traffic safety problems**

For SHSOs

- Understand how AVs fit into your mission
- Promote HAV testing and deployment; make it a priority
- Participate actively in state AV activities
- Build AV partnerships – other state organizations, law enforcement, AV and insurance industries, safety organizations
- Deliver AV information and messages
- Consider using a staff member as a single point of contact on AV issues

For law enforcement and EMS

- **Establish priority for HAV testing and deployment**
- **Participate actively in state AV working groups**
- **Coordinate closely with HAV testing and deployment**
- **Establish HAV policies, procedures, and training**
- **Provide AV information to prosecutors and judges**
- **Establish a single law enforcement point of contact for AV issues**

Questions

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Available at www.ghsa.org

Jim Hedlund, Highway Safety North
jhedlund@sprynet.com