Lifesavers Highway Safety Conference

Autonomous Vehicles: Sharing the Road with Vulnerable Users

Law Enforcement and First Responder Concerns

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Why Autonomous Vehicles?

- >37,000 fatalities per year past two years requires action to reduce.
- Local and state governments implementing reduction programs to combat fatalities.
Why Autonomous Vehicles?

- Expected to play significant part in reducing crash rates.
- Serious injury and fatal rates decline accordingly.
- Greater multi-modal transportation cooperation.
  - Pedestrians
  - Bicycles
  - Stand-up scooters
- Permit mobility for elderly, disabled or who otherwise have difficulty driving.
On Road Deployment of AV

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- Represents CO’s first testing of Automated Driving Systems vehicle on shared roadway.
- Legislation created Autonomous Mobility Task Force for review and approval of Level 4 & 5 automated vehicles as described by SAE.
Vehicles operating with some level of autonomy have experienced fatal crashes.

Operators may have over-reliance on driver assist systems
  ◦ CHP brings Tesla vehicle to stop with driver asleep at the wheel November 2018 in Redwood City, CA.

Can methods to bring automated vehicles to a safe stop be incorporated that do not violate constitutional rights.
  ◦ Police deployed “kill switch”.
  ◦ Network based systems.
Law Enforcement and First Responder Concerns

- Move Over Law: Requires vehicles to move one lane over or slow on approach to stationary emergency/maintenance vehicle.
  - Vehicles have crashed into stationary emergency vehicles while being operated with driver assist active.
  - Autonomous vehicle systems must recognize and slow on approach.
- Recognition of flagger on approach to Work Zone
  - Stop/Slow paddle movement – how to recognize and properly react.
Law Enforcement and First Responder Concerns

- Autonomous systems will have to recognize the crash event and disengage.
  - Hit and Run event if system fails to recognize crash event vs. typical roadway defect such as pothole.
  - Stopping at roadway defects not desirable.
  - Confidence of system shut-down after crash event is paramount to prevent reengagement on First Responder approach or extrication activities.
  - Component strength and reliability to remain high after experiencing roadway defects.
Roadway treatments for snow/ice removal can cause obstruction of driver assist instruments as it currently coats windshields.

AV operation if safety systems not properly maintained.
- Brake calipers, discs, pads.

Heavy trucks as AV
- Can dock-to-dock driving exist?
- Special HAZMAT concerns for routes and staging
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- Legislative direction will be required to define AV malfunction vs. violation
  - At what level of automation does a traffic violation become an equipment malfunction?
  - What entity is culpable – operator, occupant, manufacturer, and how does law enforcement assign responsibility?

- Who is the operator of the AV?
  - Do Traffic Codes amend to create civil responsibility and what does enforcement look like?
  - Liability insurance requirements?
Law Enforcement and First Responder Concerns

- **Use of AV for criminal enterprise**
  - Transport of narcotics
  - Transport of weapons
  - Human trafficking

- **Use of AV for terrorist activities**
  - Prevent use for delivering explosives to structures
  - Prevent use for driving into crowds

- **Use of AV for escape from danger when necessary**
  - Will systems allow for human takeover?
Law Enforcement and First Responder Concerns

- Technical Training for crash reconstruction
  - Will require funding and an ability to understand both the physics and logic/systems of crash vehicles.
  - Focus on cybersecurity and potential hacking to produce crash events.
Mixture of autonomous and non-autonomous vehicles
  - Will 100% AV be the goal?
    - Motorcycle riders
    - Classic car owners
    - Those who enjoy the driving experience
Law Enforcement and First Responder Concerns

- LE and FR recognize the advantages with AV
  - Reduced crash rates.
  - Reduced injury rates.
  - Reduced loss of life.

- Concerns
  - Slow response by government
    - Legislative
    - Regulations
  - Unintended consequences, both foreseeable and unforeseeable.
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