National Transportation Safety Board

Autonomous Vehicles Policy & Regulation

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NTSB

- Non-regulatory agency
- Investigate crashes to determine causes
- Make and advocate recommendations to prevent future, similar occurrences
- Most recommendations are not for additional regulations (regulatory process is slow—technology evolves quickly)
- Create and advocate for Most Wanted List

Collision Avoidance Systems

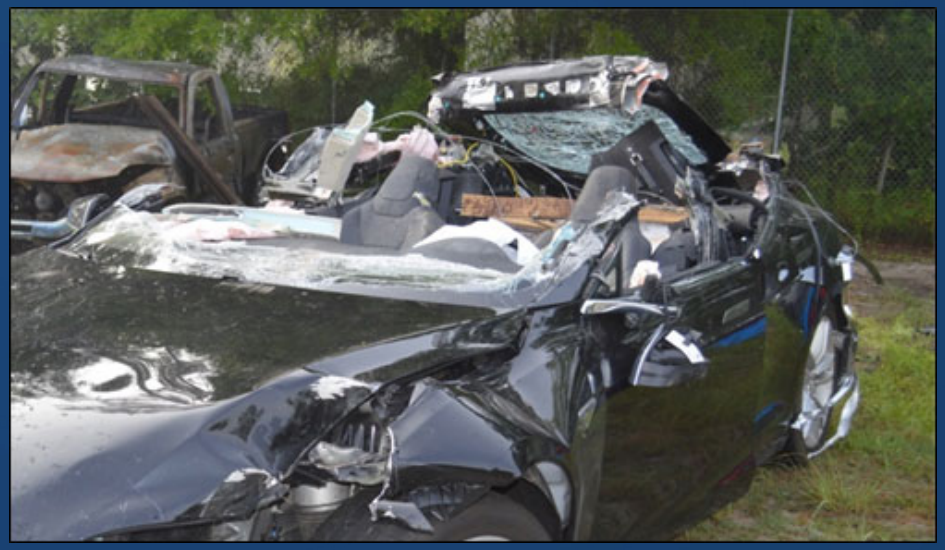
- Most common automated features are safety features such as AEB, collision warning, lane keeping,etc.
- Monitor environment but activate as needed
- Driver assist vs. driver replacement (driver controls lateral and longitudinal movement)
- Not currently mandated—NTSB has recommended they become standard in newly manufactured vehicles

Automated Features vs. Autonomous Vehicles

- Automated features are evolving towards autonomous vehicles
- Beyond driver assist
- When engaged, they constantly monitor environment and are continuously active
- System controls vehicle and (depending on level of automation) is responsible for monitoring environment

Williston Investigation

- May 7, 2016, on US Highway 27A outside Williston, Florida
- 2015 Tesla Model S, operating via Traffic-Aware Cruise Control and Autosteer lane-keeping systems, which (automated vehicle control systems in Autopilot suite)
- Struck and passed beneath truck-tractor w/ 53 ft semitrailer, fatally injuring Tesla occupant



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NTSB Recommendations to Manufacturers of Vehicles with Level 2 Automation

- Incorporate system safeguards that limit use of automated vehicle control systems to those conditions for which they were designed.

- Develop applications to more effectively sense the driver's level of engagement and alert the driver when engagement is lacking while automated vehicle control systems are in use.

NTSB Recommendations to NHTSA

- Develop a method to verify that manufacturers of vehicles equipped with Level 2 automation incorporate system safeguards that limit use of automated vehicle control systems to those conditions for which they were designed.

- Use data parameters defined by the DOT as a benchmark for new vehicles with automated vehicle control systems so they capture data that reflect the vehicle's control status and frequency and duration of control actions needed to adequately characterize driver and vehicle performance before and during a crash; the captured data should be readily available to, at a minimum, NTSB and NHTSA regulators.

- Define a standard format for reporting automated vehicle control systems data, and require manufacturers of vehicles equipped with automated vehicle control systems to report incidents, crashes, and vehicle miles operated with such systems enabled.

Other NTSB Investigations Include

- Las Vegas, Nevada—2017
  - Arma Autonomous shuttle in collision with truck (no injuries)
- Culver City, California
  - Tesla struck emergency vehicle stopped and partially occupying lane (no fatalities)
- Mountain View, California—2018
  - Tesla collides with concrete barrier dividing lanes of travel (driver fatality)
- Tempe, Arizona—2018
  - Uber autonomous feature installed on Volvo XC90 (pedestrian fatality)

Lessons Learned from Other Modes

- Aviation has become increasingly automated
- Less operator engagement can lead to distraction
- Regulation vs. voluntary stakeholder efforts (CAST)

Considerations for Future Regulations/Policy

- Navigating a diverse regulatory environment at federal, state and local level
- Technology may be advancing more quickly than regulations can realistically adapt
- Some tech is being tested, some tech is already on the market
- Commercial vs. passenger applications

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