



NHTSA Role in The Future of Automated Vehicles

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NHTSA's Mission

*Save lives, prevent injuries
and reduce economic costs
due to road traffic crashes,
through education, research,
safety standards and
enforcement activity.*



The Benefits of Automated Vehicles



NHTSA Levels of Automation

Level 0 (No-Automation):

- driver is in complete and sole fundamental control of the primary vehicle controls at all times (brake, steering, throttle, motive power)

Level 1 (Function-specific Automation):

- driver has overall control
- involves one or more specific control functions
- if multiple functions are automated, they operate independently from each other
- driver can choose to cede limited authority over primary control (as in adaptive cruise control)

NHTSA Levels of Automation

Level 2 (Combined Function Automation):

- shared authority
- automation of at least two primary control functions
 - Example: adaptive cruise control used in combination with lane centering
- driver cedes active primary control but, responsible for monitoring and safe operation
- driver expected to be available at all times
 - Note: With no advanced warning driver can relinquish control

NHTSA Levels of Automation

Level 3 (Conditionally “Autonomous”):

- driver can cede full control authority under certain traffic and environmental conditions.
- driver expected to be available for occasional control.
- designed so driver is not expected to constantly monitor roadway.

Level 4 (Fully “Autonomous”):

- human provides destination or navigational input, but is not expected to be available for control.
- responsibility for safe operation rests solely on the autonomous systems.



NHTSA Areas of Focus for Self-Driving Vehicles

1. For Licensing Drivers during testing
2. State Regulations for Testing of Self-Driving Vehicles
3. Basic Principles for Testing of Self-Driving Vehicles
4. Regulations for Vehicle Operation Beyond the Testing Phase



NHTSA Recommendations for Self-Driving Vehicles

- Ensure that the Driver Understands How to Operate a Self-Driving Vehicle Safely
- Ensure that On-road Testing of Self-driving Vehicles Minimizes Risks to Other Road Users
- Limit Testing Operations to Roadway, Traffic and Environmental Conditions
- Establish Reporting Requirements to Monitor the Performance during Testing

NHTSA Recommendations for Self-Driving Vehicles

Ensure that:

- The Process for Transitioning from Self-Driving Mode to Driver Control is Safe, Simple, and Timely
- Test Vehicles Have the Capability of Detecting, Recording, and Informing the Driver of System Malfunction
- Installation and Operation of Technologies Does not Disable any Federally Required Safety Features or Systems
- Test Vehicles Record Information about the Status of the Automated Control Technologies in the Event of a Crash or Loss of Vehicle Control
- NHTSA does *not* recommend that states authorize the operation of self-driving vehicles for purposes other than testing at this time.

Current Status



- 16 States have introduced driverless vehicle legislation
- CA, NV, FL, and the District of Columbia have enacted laws allowing driverless vehicles on roadways for testing.



NHTSA Future Steps

Vehicle:

- Technological research
- Testing and development
- Motor vehicle regulations & technology standards



Behavioral:

- Behavioral Research
- Public information, education and outreach
- Model Licensing Guidelines & laws
- Administrative Standards (to address licensing, vehicle registration, liability)



The road continues...



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