Let NHTSA Enforce Automated Vehicle Driving Regulations (LEAD’R) Act (HR 3412, 115th Congress)

Amends legislation to establish sole authority for the National Highway Traffic Safety Administration over the regulation of highly automated vehicles.

Updated last February 16, 2018
for the 07/26/2017 version of HR 3412.

WHAT IT DOES

The Let NHTSA Enforce Automated Vehicle Driving Regulations Act (LEAD’R Act; HR 3412) will establish the federal government as the sole authority regulating the design, construction, and performance of automated vehicles. Under this bill, the National Highway Traffic Safety Administration (NHTSA) will be the agency responsible for these regulations. The LEAD’R Act is part of a series of bills, furthering the development and regulation of highly automated vehicles.

The LEAD’R Act would amend 49 U.S.C. 30103 by including “Highly Automated Vehicles” in its subparagraph about preemption. Currently, section 30103(b) broadly states that the federal government preempts states’ authority to enact motor vehicle safety standards. This means that federal law is supreme on this issue. The Act also makes the following clarifications regarding state and federal roles:

- This bill clarifies that states may continue to enforce any law about autonomous vehicles so long as they do not unreasonably restrict their design, construction, or performance.
- States can continue to regulate and enforce laws about registration, licensing, driver education, safety and emission inspections, law enforcement, and traffic management.
- States will retain the authority to create laws about who can operate autonomous vehicles, where and when these cars can be driven, and traffic laws regarding their use.
- States will retain the authority to prescribe laws and regulations about car dealerships, manufacturers, and distributors and their respective sales, distributions, and repairs of autonomous vehicles.
- Any compliance with the motor vehicle safety standard does not exempt a person from liability at common law. Therefore, potential liability and insurance claims can still be brought by private citizens, insurance companies, and car manufacturers.

This bill also clarifies definitions relating to highly automated vehicles, their features and operations. In particular, the bill does not include regulations for “commercial motor vehicle[s] (as defined in section 31101).”

RELEVANT SCIENCE

Highly automated vehicles are cars that use advanced technology to sense their surroundings to operate on public streets with varying levels of human involvement. These technologies include cameras, radars, and light detectors that enable these vehicles to perceive other vehicles, obstacles, and traffic signs.

Fully autonomous vehicles are equipped with SAE Level 5 automation systems, where the vehicle can perform all operating functions with no human input; vehicles can drive themselves from a starting point to an ending point independently. Fully autonomous operation requires the effective integration of multiple technologies:
Sensors are used to create and maintain a perception of objects within a vehicle’s surroundings. Most current autonomous vehicles are equipped with different combinations of four main types of technology, including cameras, RADAR, LIDAR, and ultrasonic sensors. First, cameras visually detect objects around the vehicle. Cameras are advantageous for object recognition because they detect light and color, but struggle with depth perception. Second, radio detection and ranging (RADAR) detects surrounding by sending out electromagnetic waves that reflect off objects and provide information about how far away the object is and how fast it is moving. These signals allow vehicles to see hundreds of feet away in vision-impairing conditions, but most cannot detect height and only provide a 2-D perception of the world. Third, light imaging detection and ranging (LIDAR) produces a 3-D map of the surrounding world by using scanning lasers to measure the distance between the vehicle and other objects. These sensors are most effective for identifying obstacles of the vehicle, but are currently too expensive for commercial production. Lastly, ultrasonic sensors function by measuring sound waves reflecting off solid objects. These sensors have a very short range, but are very effective for three-dimensional mapping with accuracies within a centimeter, and outperform radar at close range.

Global Positioning Systems (GPS) are used to collect vehicular location data. GPS determine the present location of the vehicle by analyzing signals received from satellites.

Inertial Measurement Units (IMU) are used to collect vehicular motion and rotation data. Such systems supplement GPS in instances where satellite data is unavailable; they cannot determine absolute vehicular position, but can determine the location of a vehicle relative to its starting point.

Processors and software function as the brain of the car, performing large-scale data processing to interpret sensor data in real time and make autonomous decisions accordingly. These systems use machine learning algorithms to detect patterns in the data they receive from sensors and GPS. These systems then make various decisions based on that data, such as identifying and following traffic signs and markings.

In contrast, semi-autonomous vehicles require a driver to perform some driving operations, depending on level of vehicle autonomy. Semi-autonomous vehicles may possess a limited number of these features or allow such features to be disabled.

BACKGROUND

HR 3412 clarifies which powers to the regulate automated vehicles are delegated to the federal government and the states. This separation of state and federal powers is known as federalism.

While the federal government would be responsible for the regulation of the design, construction, and performance of automated vehicles, the states will retain all other authorities. For example, New Hampshire currently does not have a law requiring adults to wear seat belts.

NHTSA has adopted the International Society of Automotive Engineers’s (SAE) categories of autonomous vehicles, which creates a system for classifying automated vehicles according to six levels.

- Level 0 (No Automation): A typical car where the human driver is in full control of the dynamic driving task, like steering, accelerating, braking, and parking.
- Level 1 (Driver Assistance): A car where a computer can handle either the steering or acceleration/deceleration, but not both. Examples include adaptive cruise control and park assist.
- Level 2 (Partial Automation): A car where a computer handles both the steering and acceleration/deceleration concurrently at times. The driver is still responsible for taking over at any time and must remain alert by monitoring the driving environment. Tesla’s current Autopilot system is an example.
- Level 3 (Conditional Automation): A car where the automated driving system monitors the driving environment and the human driver only has to “respond appropriately to a request to intervene.”
- Level 4 (High Automation): A car where the system does not rely on the human to respond to emergency situations. Future Category 4 cars may not have a steering wheel, gas or brake pedals. Current examples are Waymo cars.
- Level 5 (Full Automation) A car does not require the driver at all under any conditions. For example, these types of cars would not need steering wheels, and the inside interior can be converted into a social space with a seat facing backwards.
These different types of automated vehicles where computer algorithms take over the decision-making process of driving raises new issues for our government to handle. Most of these issues implicate ethics, business, and the law.

In 2016, 37,461 people died due to motor vehicle related accidents in the US alone. Possibly 94 percent of serious crashes are a result of human errors. The motivation behind the deployment of automated vehicles includes the potential for safety improvements over human-operated vehicles.

There are also economic and social incentives to regulate automated vehicles: vehicle crashes in 2010 cost $242 billion in economic activity, in addition to $594 billion due to loss of life and costs related to decreased quality of life. Americans also spent an estimated 6.9 billion hours in traffic delays in 2014. Automated vehicles could help reduce the time, fuel, and productivity costs associated with this time spent on the road, by increasing coordination between vehicles. In addition, completely automated vehicles may turn transit time into productive time. Disabled and underserved populations lacking practical transit options may have increased access to transportation. Improved mobility is addressed in HR 3413, the Access Act, which is mentioned below.

Automated vehicles will not be immune to cybersecurity threats as hackers will have great potential to access and control multiple vehicles at one time. This potential for destruction and terroristic use cannot be overlooked and is also addressed by HR 3411, mentioned below.

ENDORSEMENTS & OPPOSITION

At present, there have not been any publicly reported endorsements of or oppositions to this bill.

STATUS

HR 3412 was introduced in the House on July 26, 2017, and referred to the House Committee on Energy and Commerce. On July 28, 2017, the Committee on Energy and Commerce referred the bill to its Subcommittee on Digital Commerce and Consumer Protection.

RELATED POLICIES

- **S 1885 – AV START Act**: Supports the development of autonomous vehicle technologies (SciPol brief available).
- **HR 3388 – SELF DRIVE Act**: Requires the Department of Transportation to “complete research to determine the most cost effective method and terminology for informing consumers about the capabilities and limitations of [autonomous vehicles].”
- **HR 3405 – Maximizing Opportunities for Research and the Enhancement of Automated Vehicles (MORE) Act**: Expands exemption of standards for the purpose of car manufacturers to conduct further testing and evaluation of autonomous vehicles.
- **HR 3406 – Practical Automated Vehicles Exemptions (PAVE) Act**: Increases the annual number of vehicles that may be exempted from meeting certain safety standards for manufacturers.
- **HR 3407**: Requires car manufacturers to develop a cybersecurity plan along with an individual “as the point of contact with responsibly for the management of cybersecurity.”
- **HR 3408 – EXEMPT Act**: Establishes exemptions for motor vehicle safety standards to ease the development of autonomous cars.
- **HR 3411**: Establishes an Automated Driving System Cybersecurity Advisory Council within NHTSA responsible for “mak[ing] recommendations regarding cybersecurity for the testing, deployment, and updating” of autonomous vehicles.
- **HR 3413 – Access Act**: Creates a council to provide recommendations on how to increase mobility for the elderly and those who may not be able to access traditional forms of transportation.
- **HR 3414**: Creates a “Disability Mobility Advisory Council” to research and recommend ways that mobility for disabled persons can be increased.

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