

## **NHTSA's Drive For Automated Vehicle Safety**

In its "Preliminary Statement of Policy Concerning Automated Vehicles," issued May 30, the National Highway Traffic Safety Administration (NHTSA) strongly recommended that states not allow operation of self-driving vehicles on public roadways except for testing purposes.

Although the primary purpose of the policy statement is to caution the states, the statement also attempts to sort through the confusion that has arisen surrounding concurrent technological developments in the automotive sector. The policy statement is the latest of several significant regulatory-related pronouncements that have issued within the past few months on this topic, which has also been the subject of recent congressional hearings.

### **Background of Policy Statement**

Since the early 2000s, the U.S. Department of Transportation, through its various agencies, has worked closely with the major automotive manufacturers and other state and private sector stakeholders on development of "connected vehicle" technologies that will allow vehicles to communicate with each other (vehicle-to-vehicle or V2V) and with roadside infrastructure (vehicle-to-infrastructure or V2I).

Although this effort initially focused primarily on V2I, the department's more recent focus, through the NHTSA, has been on V2V safety communications, with a secondary focus on V2I and vehicle-to-mobile device applications.

The NHTSA is expected to make a long-awaited decision later this year on potential regulation of V2V. The NHTSA has estimated that the technology ultimately could result in more than an 80-percent reduction in unimpaired-operator vehicle crashes.

If the agency decides to initiate a safety-standard rule-making, one of various options it is considering, it presumably would do so with an advance notice of proposed rule-making (ANPR) — essentially, a detailed information request notice — which it has done in previous complex rule-makings before proceeding to the proposed rule stage.

Given the number and range of complicated issues — in many respects, unprecedented in the motor vehicle context — that would be presented by a rule-making involving implementation of a cooperative vehicle communications system, a final rule conceivably may not issue until well into the latter half of this decade.

While this joint effort has been underway, major automotive manufacturers and equipment suppliers have been moving aggressively to develop more advanced in-vehicle collision avoidance warning and driver-assist safety systems. Using a combination of numerous in-vehicle sensors and various detection technologies, an increasing range of new model passenger vehicles are now equipped with warnings-only or combined warnings and driver-assist systems to reduce the risk of forward and lane-change collisions.

Recent data indicate that 29 percent of new vehicles have optional forward-collision avoidance, and 12 percent have autonomous braking capability. Insurance claims data based on a limited study by the Insurance Institute for Highway Safety released in April suggest that forward-collision avoidance systems with autonomous braking are already producing measurable benefits in reduced claim frequency for property damage and bodily injury liability.

The NHTSA recently announced that it will decide by year-end whether to initiate rule-making on automatic braking or conduct additional research on deployment of the technology.

It is widely anticipated that these and other collision-warning and avoidance systems will become standard on many new models in the near future. If these safety technologies follow the path of other collision-avoidance technologies such as electronic stability control (ESC), one or more may eventually be required on all new vehicles as Federal Motor Vehicle Safety Standards. Backover avoidance is currently in the NHTSA rule-making as a result of congressional legislation.

The potential safety benefits of these and other emerging technologies was further reflected in the NHTSA's April 5 request for comments on potential expansions to its New Car Assessment Program (NCAP), which provides rating information to allow consumers to compare the safety features of various new passenger vehicles.

Building on its earlier enhancement of the NCAP that promoted ESC, lane-departure warning and forward-collision warning systems, the NHTSA is now requesting comment on possible additional warning and collision-intervention enhancements to the NCAP, including, among others, blind-spot detection, lane-departure prevention (automatic lane-keeping), forward-collision advanced braking and automatic pedestrian detection and braking.

Paralleling these developments is the NHTSA's continuing focus on driver distraction. Under DOT Secretary LaHood's tenure, no automotive safety issue has garnered more attention than driver distraction. Although the principal focus of this concern has been use of cell phones and texting while driving, the broader focus has encompassed concerns over potential distractions from other in-vehicle safety and nonsafety-related applications.

In early April, the DOT publicized the results of a study indicating that use of hand-held cell phones in vehicles remained unchanged from 2009 to 2011, while texting doubled during the same period, despite bans on text messaging in nearly four-fifths of the states.

In late April, the NHTSA issued its first-phase voluntary guidelines to reduce visual-manual distraction. These guidelines apply to original motor vehicle equipment which drivers use to perform secondary functions such as information gathering, communications, entertainment, navigation, etc. The guidelines recommend that where secondary tasks inherently interfere with the driver's ability to operate the vehicle safely, manufacturers should design the devices so that the driver cannot use them while driving.

None of these safety technologies, however, has drawn nearly as much recent media attention as the so-called "driverless" vehicle. In addition to the highly publicized Google self-driving vehicle, a number of vehicle and equipment manufacturers are working to develop various versions of an automated vehicle.

The topic was the subject of hearings before the U.S. Senate Committee on Commerce on May 15. Recognizing the great potential of advances in vehicle technology, senators also raised concerns about driver distraction and the reliability and security of computer-based systems connected to external communications networks. Addressing the latter concern, the NHTSA recently created a unit to assess cybersecurity risks to V2V communications systems.

### **The NHTSA's Policy Statement**

The NHTSA issued its preliminary policy statement on automated vehicles against this rapidly changing backdrop. With several states already enacting laws allowing operation of self-driving vehicles in certain conditions, and a number of others considering such legislation, the NHTSA's statement clearly was intended to remind states of the significant safety implications of moving prematurely to allow highway operation of such vehicles.

The statement also reiterates that while the states play important roles in regulating vehicle use and driver requirements, it is the NHTSA, not the states, that is responsible for the safety evaluation and, if necessary, regulation of new motor vehicles and equipment. (Under the National Traffic and Motor Vehicle Safety Act, the FMVSS expressly preempt conflicting state standards.)

Importantly, however, the NHTSA statement also attempts to place the self-driving vehicle as well as other emerging automotive technologies into a broader, unified regulatory perspective. The statement identifies three "distinct but related streams of technological change and development" — in-vehicle crash avoidance systems, either warnings-only or warnings with limited automated control of safety functions; V2V communications supporting various crash-avoidance applications; and self-driving vehicles.

Specifically noting the “fair amount of confusion” surrounding terminology and distinctions relating to these safety technologies as well as the potential for “greater confusion or disarray,” the NHTSA’s statement sets out a five-tier continuum:

Level 0: no automation — driver controls all primary vehicle controls; systems that provide only warnings are in this category, but the warning systems may augment or be necessary to full operation of automated systems)

Level 1: function-specific automation — automation of one or more control functions, but multiple automated functions operate independently of each other (e.g., cruise control, automated braking, lane-keeping)

Level 2: combined function automation — at least two primary control functions are automated and work in unison (e.g., adaptive cruise control combined with lane-centering), with the driver still expected to monitor road conditions at all times and be prepared on short notice to resume control of those functions

Level 3: limited self-driving automation — driver may cede full control of all safety-critical functions, but only in certain traffic or environmental situations (e.g. work zones), and would be available to re-engage driving tasks with appropriate transition time

Level 4: full self-driving automation — vehicles (occupied or unoccupied) perform all safety-critical driving functions and road monitoring for entire trip, based on driver destination or navigation inputs

The NHTSA’s statement then discusses the agency’s work on various warnings-only and level 1 automated technologies (e.g., ESC, automated braking) and describes in detail the agency’s research activities and plans for level 2 to 4 technologies, including human factors, development of systems performance requirements and evaluation of the safety of electronic controls systems. The agency notes the difficulty of researching the development of system performance criteria, given that even at level 2, few technologies currently exist in operation.

Acknowledging the desire of some states for guidance regarding self-driving vehicles, the NHTSA’s statement offers a number of recommendations tailored to vehicles that would employ level 3 and 4 systems. Consistent, however, with the NHTSA’s position that states should not allow self-driving vehicles at this time except for testing purposes, virtually all of these recommendations involve drivers and vehicles solely in the testing context.

In addition, the NHTSA reminds the states that any regulation that allows operation of self-driving vehicles on public roads must ensure that entities installing the automated technology not disable or degrade safety systems required by federal regulation.

## **Conclusion**

The NHTSA’s preliminary policy statement recognizes the potential safety and other benefits from the increasing automated driving, as well as the importance of regulatory policy not impeding continued innovation. On the other hand, the statement voices clear concern regarding overly permissive operation of automated technologies, cautioning the states against allowing operation of self-driving vehicles, except for testing purposes, and offering detailed recommendations in the testing context.

The statement also attempts to add much-needed clarity to the often confusing treatment of automated-related technologies by articulating a multitier conceptual framework, which may provide a useful common ground for future discussion in this vitally important and rapidly evolving safety arena.

To learn more, contact Paul M. Laurenza, Office Managing Member of Dykema’s Washington, D.C. Office and member in the Firm’s Government Policy & Practice group, at 202-906-8646.

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