Defining moment as regulators question 'driver' of self-driving car

Ian C. Graig, Chief Executive of Global Policy Group, looks at the confusing definition of the word 'driver' as autonomous drive technology evolves

The rapid emergence of autonomous vehicle technologies, with their far-reaching implications for highway safety, is posing myriad challenges for government safety regulators. One of the most daunting of these challenges goes to the very heart of regulators' mission to ensure that the next generations of vehicles are safe: how should regulators define who or what is the 'driver' of a self-driving vehicle?

Advances in vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2X) technologies, which could eventually lead to the development of fully autonomous vehicles, offer the hope of a future with far fewer crashes and less traffic congestion. Officials at the US Department of Transportation and its National Highway Traffic Safety Administration (NHTSA) hope to help the US move toward that safer future by encouraging the development and deployment of V2X technologies. At the same time, however, those officials recognise that a safe transition to a more self-driving future requires a regulatory structure that can meet the challenges raised by the development of autonomous vehicle technology – challenges that were unimaginable when many current safety rules were written.

Defining who or what is driving a self-driving vehicle is vitally important to building that regulatory structure. Many current vehicle safety regulations are premised on the quaint notion that a vehicle will be actively controlled by a human driver seated behind the wheel, operating the steering and brakes and monitoring the gauges and other indicators – a notion that was largely self-evident until autonomous vehicles started to move from science fiction to the highways.

Take away the human driver, and many of the regulations that have long helped ensure that vehicles are safe become inapplicable, outmoded, or simply irrelevant. The same holds true for the procedures used to test whether vehicles comply with those safety regulations. The regulatory structure also must help ensure a safe transition during a time in which vehicles driven by humans may interact on the highways with wholly or partly self-driving vehicles. Concerns about those transitional challenges have grown more intense as vehicle manufacturers (most recently Ford) announce plans to begin deploying some fully autonomous vehicles on US highways within the next several years. At least initially,

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some of those vehicles may still have traditional driver controls like a steering wheel and brakes, but others may not.

This issue is particularly vexing in the US, where vehicle manufacturers themselves 'self-certify' that their vehicles meet applicable federal motor vehicle safety standards (FMVSS). Without a clear definition of who or what is driving, vehicle manufacturers will face a major challenge certifying that a self-driving car complies with safety regulations that are premised on the presence of a human driver. This lack of clarity could raise liability concerns, while potentially slowing the deployment of autonomous vehicle technologies.

An exchange earlier this year between NHTSA and Google's Self-Driving Car Project illustrated how regulators and vehicle manufacturers alike are grappling with the conceptual challenge of defining the "driver" of a fully autonomous vehicle. Google's self-driving cars do not have any conventional driver controls or interfaces (steering wheel, brake pedal, etc.) but rather are driven entirely by the vehicle's computer-based self-driving system (SDS). Ford has said that its vehicles will also be completely autonomous, lacking controls and interfaces that would allow a human to wrestle control from the vehicle's SDS. In contrast, the Tesla Model S involved in a widely reported fatal crash earlier this year while its Autopilot system was engaged and essentially driving the car still featured conventional controls and interfaces that could allow the human driver to take control.

In a letter that addressed questions earlier raised by Google, NHTSA said it would interpret the Google car's self-driving system itself, rather than any of the vehicle's occupants, as the "driver" for purposes of answering Google's questions about federal safety standards. Using this interpretation as a "foundational starting point," NHTSA went on to explore "whether and how" Google could certify that such a self-driving vehicle meets standards "developed and designed to apply to a vehicle with a human driver." The letter addresses over 50 specific instances in which federal motor vehicle safety standards could be affected by not having a human "driver," including rules related to the steering wheel, pedals, mirrors, etc. – driver controls and interfaces that would notably be lacking in Google's self-driving car.

Some media reports portrayed this as a ruling by NHTSA that a computer-based SDS can be considered a car's "driver" under federal standards. But the letter does not go that far. Instead, it merely states that it would be "reasonable" for purposes of discussion to interpret the SDS as the driver of the Google vehicle, since the vehicle lacks the conventional controls that would allow a human to drive it. The letter explicitly notes that NHTSA cannot use such an interpretation to make substantive changes in existing statutes and regulations, however. In this case, those statutes and regulations define a vehicle's "driver" as the human occupant seated immediately behind the steering wheel.

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The exchange between NHTSA and Google illustrates the process through which regulators and both traditional and non-traditional vehicle manufacturers are exploring how vehicle safety regulations are affected or challenged by autonomous or semi-autonomous vehicle technology. NHTSA stated in its letter that many of the questions raised by Google presented issues "beyond the scope and limitations of interpretations," and that such issues could only be addressed through "other regulatory tools or approaches."

Such approaches could include a rulemaking to write new safety standards using a formal "notice and comment" process. Such a process can take years, however, and autonomous vehicle technology is moving forward at a much faster pace. Many V2X technologies are already appearing on vehicles sold in the US, particularly on luxury models. Indeed, concerns have been raised about whether self-driving features are being pushed into the market at a pace more typical of information technology products than automobiles.

The rapid development of V2X technologies is leading NHTSA to address the associated regulatory challenges using a mix of traditional regulatory mandates, informal guidance, interpretations of existing regulations, and voluntary agreements with vehicle manufacturers. While only regulations written through a formal rulemaking process have legal statutory authority, more informal approaches can address some issues on at least an interim basis. NHTSA is expected to release guidelines soon that will begin to address some of the regulatory issues associated with safely deploying self-driving vehicles on public highways, for example.

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A formal rulemaking might be required to change the regulatory definition of "driver" in light of the ongoing development of self-driving vehicles, however, as NHTSA indicated in its letter to Google. NHTSA also warned that even defining the SDS as the "driver" of a self-driving car would merely be a starting point, and would not answer all the questions associated with certifying such a car's compliance with federal safety regulations. A further complication is the role of the US states in this debate, as each state defines who can obtain a license to drive a vehicle within its borders. The state of California, for example, is developing rules that would require a licensed driver to be present and able to take control at all times in a self-driving car.

Defining who or what is driving a self-driving vehicle is an essential step in the ongoing transformation of the automobile and of the statutes and regulations designed to ensure highway safety. As NHTSA noted in its letter to Google, however, arriving at a new definition of "driver" hardly answers all the regulatory questions raised by autonomous vehicle technology. Such questions in fact seem to arise almost as quickly as automotive firms develop and seek to deploy the new V2X technologies that are fundamentally changing the nature of the automobile and the automotive industry itself.