

October 25, 2016

Mark Rosekind, Ph.D.
Administrator
National Highway Traffic Safety Administration
1200 New Jersey Avenue, SE
Washington, DC 20590

**RE: The National Society of Professional Engineers' Public Comment on
Docket ID No. NHTSA-2016-0090-0001**

Dear Dr. Rosekind:

On behalf of the more than 31,000 members of the National Society of Professional Engineers (NSPE), NSPE submits this comment in response to the National Highway Traffic Safety Administration's (NHTSA) *Federal Automated Vehicles Policy* announced on September 20, 2016. Recognizing the promise of autonomous vehicles and the critical importance of innovation to our society, NSPE has been a leading advocate on the need to place the public health, safety, and welfare first and foremost in the development and deployment of autonomous vehicle technology, and require a licensed professional engineer to play a key role in the development, testing, and safety certification of autonomous vehicles.

NSPE has proactively participated in NHTSA's rulemaking process that culminated in the development of these guidelines. On April 8th, NSPE Executive Director Mark Golden presented NSPE's remarks at the national hearing convened by NHTSA in Washington, DC. NSPE submitted formal comments, including the remarks presented to the panel as part of the initial rulemaking. NSPE is disappointed that several major safety issues were not addressed in NHTSA's recently released *Federal Automated Vehicles Policy*. Given the unique technical expertise that professional engineers possess, which is grounded in ethical commitments to the public health, safety, and welfare, NSPE strongly believes professional engineers can play a key role in addressing the ethical and technological challenges raised by autonomous vehicles, and strongly urges NHTSA to reconsider and revise its guidelines to address the following key issues:

- There is no requirement for a third-party certification of autonomous vehicles and technologies by someone in the decision chain who has a duty that puts public safety first and overrides competitive pressures— i.e., a professional engineer. These guidelines allow manufacturers and suppliers to self-certify, eliminating a critical third-party safety check. In the absence of a third-party certification, verification is needed by a licensed professional engineer, internal to the development company. The licensed professional engineer will affix his or her seal to the engineered component

attesting to the conclusion that the design is adequately protective of the public health, safety, and welfare.

- The enormous ethical implications of deploying autonomous vehicles are simply not addressed. While the guidelines acknowledge there are major ethical issues, no proposed methods for addressing them are provided, leaving these critical considerations up to manufacturers and interested stakeholders. Professional engineers should play a key role in this evaluation as their oath in holding the license is to place the public health, safety, and welfare above all other considerations.
- Despite encouraging results of autonomous vehicle deployments in controlled environments, there is still significant work to be done before the achievement of human-operated and autonomous vehicles safely sharing public roadways. Many environmental factors— human drivers, weather, pedestrians, road conditions—are common, rapidly changing, and highly unpredictable. The guidelines assume these hurdles will be easily overcome and do not provide for adequate safety protections. Autonomous vehicles, as part of an overall transportation system, must be sufficiently capable of addressing these in a safe and reasonable manner.

The guidelines announced by NHTSA, while not binding, will play a key role in the development and deployment of autonomous vehicles. NSPE is encouraged that NHTSA recognizes the need for continual evaluation of the guidelines and that revisions will be considered on an annual basis. NSPE strongly suggests that in 2017 NHTSA revise the document to address these three key omissions.

In the White House's recently published report: *Preparing for the Future of Artificial Intelligence*, the key role of engineers is specifically noted. In particular, the report states that:

“Experience in building other types of safety-critical systems, such as aircraft, power plants, bridges, and vehicles, has much to teach AI practitioners about verification and validation, how to build a safety case for a technology, how to manage risk, and how to communicate with stakeholders about risk. At present, the practice of AI, especially in fast-moving areas of machine learning, can be as much art as science. Certain aspects of practice are not backed by a well-developed theory but instead rely on intuitive judgment and experimentation by practitioners. This is not unusual in newly emerging areas of technology, but it does limit the application of the technology in practice. Some stakeholders have suggested a need to grow AI into a more mature engineering field. As engineering fields mature, they typically move from an initial “craft” stage characterized by intuition-driven creation by talented amateurs and a do-it-yourself spirit; to a second commercial stage involving skilled practitioners, pragmatic

improvement, widely accepted rules-of-thumb, and organized manufacture for sale; to a mature stage that integrates more rigorous methods, educated professionals, well-established theory, and greater specialization of products. Most engineering fields, having a much longer history than modern AI, have reached a mature stage. In general, mature engineering fields have greater success in creating systems that are predictable, reliable, robust, safe, and secure. Continuing the progress toward AI becoming a mature engineering field will be one of the key enablers of safety and controllability as more complex systems are built.”

Professional engineers clearly have a critical role to play in this process. NSPE greatly appreciates this opportunity to provide comment on NHTSA’s *Federal Automated Vehicles Policy*. NSPE and the professional engineers it represents have a foremost responsibility to protect the public health, safety, and welfare—and to make others aware of ways that safety may be jeopardized. If we can answer any questions or comments, please contact Arielle Eiser, Senior Manager of Government Relations, at aeiser@nspe.org.

Sincerely,



Kodi Jean Verhalen, P.E., F.NSPE
President
National Society of Professional Engineers

cc: Nathaniel Beuse, Associate Administrator for Vehicle Safety Research,
National Highway Traffic Safety Administration

Frank Barickman, Electronics Team Leader for Vehicle Research and Test
Center, National Highway Traffic Safety Administration

Steve Wood, General Attorney for Office of Chief Counsel, National
Highway Traffic Safety Administration