NHTSA PUBLIC HEARING: Guidelines for the Safe Deployment and Operation of Automated Vehicle Safety Technologies

April 8, 2016 – Washington, DC

Thank you to the Department of Transportation and the National Highway Transportation Safety Administration for holding this hearing today. My name is Mark Golden and I am the Executive Director of the National Society of Professional Engineers, a multi-disciplinary association of licensed engineers across the United States. Licensed professional engineers, or PEs, must undergo a rigorous licensing process, encompassing education, examinations and work experience under the direction of a previously licensed PE before being authorized by their state to engage in those aspects of engineering that are most critical to public health, safety and welfare.

The promise of autonomous vehicles is significant in ways that go far beyond mere transportation. Fully proven, autonomous vehicle technology offers the potential to significantly enhance the quality of life in the United States, in terms of traffic safety and in eliminating barriers to full participation in society for persons with disabilities.

However, as impressive and encouraging as the speed of development and innovation in controlled environments have been, there is a significant work to be done before achieving the ultimate goal of an environment in which human-operated and autonomous vehicles can safely share the roadways and respond to the myriad of commonplace, constantly and rapidly changing, but highly unpredictable human, weather, road condition, situational and other factors that can instantly create hazardous conditions with zero tolerance for a failed or delayed response.

Therefore, it should come as no surprise that NSPE and the community of licensed engineers, whose primary concern is and always has been delivering the benefits of technology and innovation in a manner consistent with public health, safety and welfare, have taken a very strong interest in the development of guidelines pertaining to autonomous vehicles. We have been working with state DOTs as they consider regulations pertaining to the development and deployment of autonomous, most recently, in California and Nevada.

In the early 20th century, industry and government did not set out to intentionally build dangerous buildings, bridges, or water systems. But, in some instances, the need for such basic
infrastructure and the pressure to meet demand developed more rapidly than the necessary evaluations related to public safety could be performed. Failures, with tragic consequence, were the result. This history should not be allowed to repeat itself.

The development and introduction of autonomous vehicles is as historic and epoch-making as the introduction of motorized vehicles themselves in the 19th century. Accordingly, autonomous vehicles and intelligent road systems are areas of innovation that require attention now, while the new technology is still emergent. And that attention should come from people with not only appropriate technical expertise, but also the ethical and safety accountabilities of licensed professional engineers.

The U.S. Department of Transportation/National Highway Traffic Safety Administration’s recent announcements of (and promise of significant resource investments in) autonomous vehicle safety initiatives, including this hearing today, are to be commended for their recognition of the importance of “a path to national consistency.” Even at these early stages, there is reason for concern over potential and fundamental conflict between the diverse approaches to autonomous vehicles being taken by the various states, localities and federal regulatory agencies. For example, whether to require or rely upon smart road systems rather than entirely upon vehicle control software.

Furthermore, the importance of transparency in this process cannot be overstated. In a March 15, 2016, Senate Commerce hearing on autonomous vehicles, Senator Bill Nelson raised the issue of transparency and the need to put safety first. He cited recent tragedies and obfuscations from automobile manufacturers, including: GM ignition switches, Takada airbags; and the VW emissions scandal.

In such an environment of understandable public skepticism and distrust, an open, transparent and collaborative involvement of federal, state and local regulators, industry and the public will enhance, not diminish the economic performance and speed of deployment for manufacturers.

Such transparency and consistency is necessary to increase public awareness understanding and acceptance of the new technology, which will in turn speed deployment.

In the public notice, NHTSA raised several broad issues for comment. NSPE and its expert professional engineers have reviewed them and offer the following input, which we look forward to expand upon through written comments.

First, as to operational guidelines:

NSPE has carefully reviewed and provided input to the California DMV on its proposed regulations. NSPE understands that there have been concerns about the California DMV’s
approach. However, their proposed regulations do address many of the questions posed here, such as operational guidelines for roadway scenarios, operational environments and the associated design and evaluation processes and methods to ensure the protection of the public health, safety and welfare.

On the issue of roadway scenarios:

Automotive transportation in the United States requires a significant amount of travel on not only public roadways, but private roads, toll roads, private drives, parking lots, intermodal facilities, ferries, parking garages, etc. In fact, most journeys will in fact begin and end on non-public roadways and often will include intermediate segments that will take the vehicle off public roadways.

Roadway markings have proven to be absolutely critical to the functioning of autonomous vehicle technology. This issue recently garnered substantial media attention when Volvo’s North American CEO [Lex Kerssemakers] publicly complained to Los Angeles Mayor Eric Garcetti that their testing was hampered by faded road markings in LA.

Here is a difficult but unavoidable truth: If autonomous vehicles are struggling to find lane markings in America’s second most populated city, they are going to have a really hard time finding lane markings on the thousands of miles of poorly paved roads across America. Even in our urban centers and surrounding suburbs, faded or nonexistent markings are commonplace. Until the technology has advanced beyond the point where the typical and ordinary conditions the vehicles will routinely experience in the field, it is dangerous, impractical and a major threat to the public health, safety and welfare to deploy them.

On the issue of operational environments:

Again, real life is messier than in the design laboratory. The weather, ability to follow the planned route, and a myriad of other circumstances can and do change quickly and without notice on our roadways. Accordingly, autonomous vehicles need real-time functions for driving in all weather conditions and for both daytime and nighttime driving, and in particular the processes and responses needed when driving conditions change during operation, taking the vehicle outside of its approved operating conditions.

Autonomous vehicles need to be able to better address changes in vehicular traffic, both from other autonomous vehicles and non-autonomous vehicles, non-merging movements and allow for 360 degree perspective. In one meeting with industry, we were told that “as long as our autonomous car can avoid running into anything, what is going on behind it can take care of itself.” That exhibits a fundamental lack of appreciation of the realities of the roadway.
In the area of testing and compliance:

We have been impressed by, and commend the seriousness of the commitment to safety that manufactures and developers have demonstrated. However, a century of experience demonstrates that protection of public safety is best served when there is someone in the decision chain who does not face pressure from shareholders or non-technical management to meet budget, project timeline or sales projections.

Public safety is best served when there is someone in the decision chain who has a duty that overrides competitive pressures to be first to market or surpass other manufacturers’ offerings. Someone who has a clear and enforceable duty that overrides even peer pressure to be a team player and not the department or group within the corporation whose legitimate safety concerns might delay a high-stakes project.

Because of the profound ramifications for public safety and welfare from the use of autonomous vehicles, the multiple engineering disciplines involved in autonomous vehicles systems, and the accountability of licensed professional engineers to act in the interests of the public, it is the position of NSPE that the manufacturer’s certification of their vehicle’s compliance with all relevant state and federal standards and regulations must be performed by licensed professional engineers.

For many of the same reasons, there is a need for independent, third-party testing of vehicles prior to their deployment on public roads. Since such testing regimes fall within the practice of engineering under state licensure regulations, such tests should also be performed under the supervision of licensed professional engineers.

Finally, the notice asked what aspects of autonomous vehicle technology may not yet be suitable for guidelines. As stated earlier, there are still major thresholds for safety that must be met. We do not believe that the technology has yet advanced enough to deploy fully autonomous vehicles. Deploying such cars when there are still issues with navigating in inclement weather, merging at intersections, responding to non-autonomous vehicles, responding to road hazards or sub-optimal operating conditions—in short, responding to the unexpected and variable conditions that manned vehicles routinely face on the roadway today—a vehicle without an operator poses a major threat to the public safety. Let’s acknowledge the current limitations of the technology, work within those limitations, and take an important first step, not a final one, to develop and deploy technology that offers significant but as-yet-unproven promises for improved transportation efficiency and safety.

Thank you.