

Statement of Paul R. Brubaker  
President and CEO  
Alliance for Transportation Innovation  
Before the Subcommittee on Transportation, Housing and Related Agencies  
Committee on Appropriations  
United States Senate

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Chairman Collins, Ranking Member Reed, and Members of the Subcommittee, on behalf of the Alliance for Transportation Innovation (ATI21.org), I would like to thank you for the opportunity to share our views on integrating autonomous vehicles onto our nation's roads.

ATI21.org is a not-for-profit created to accelerate the deployment of technologies and innovation that can dramatically improve the safe and efficient movement of people and goods. Our members are associations, companies, and government and academic entities, as well as individuals who are dedicated to our mission.

The need to accelerate the path to self-driving is not only critical to our country's economic future, but also our technological standing in the world. The potential safety and social benefits are enormous, and we are on the cusp of reliably and safely replacing human drivers with technology enabled mobility platforms—self-driving vehicles—that will transform how we move people and goods.

Accelerating development and deployment of self-driving vehicles holds the promise of saving tens of thousands of lives every year, reducing crash-related injuries, and fundamentally transforming personal mobility. As soon as we achieve full self-driving, distracted and drunk driving will no longer claim lives; adult children will not have to have the conversation with aging parents about taking away their car keys; the poor will have access to much more convenient and affordable transportation; and the physically and developmentally disabled, including my soon to be adult son on the autism spectrum, will have access to transportation options. There is no doubt that safe, affordable, accessible, and convenient transportation is critical for everyone's quality of life.

While the technologies to enable self-driving are being rapidly developed, the desire to get these capabilities to market are highlighting profound shortcomings in our national approach to regulation. Specifically, the regulatory process is simply not keeping up with the pace of innovation. While this is not unique to self-driving, the rapid development of autonomous vehicles presents us with an opportunity to revisit our regulatory approach and offer reforms that are more suitable to the digital age. It is imperative. In this case the cost of delay is measured in lost

members of our families, of pain and suffering, and the denial of economic, health and social opportunity for the elderly, disabled and the impoverished.

That said, in the Obama Administration, Transportation Secretary Anthony Foxx and Administrator Mark Rosekind of the National Highway Traffic Safety Administration (NHTSA) get it. It is clear that the administration has a profound understanding of the critical technologies that have rapidly developed during the President's tenure and have laid the groundwork for the next administration to propel us into the self-driving future. The path will not be easy. There are considerable and complex cultural and regulatory barriers that must be overcome, and industry, researchers, the public, and government at all levels will need to engage and collaborate.

In late September the Department of Transportation issued its much anticipated autonomous vehicle (AV) policy guidance in what we believe represented a well-intentioned and thoughtful first-step toward ensuring that the Department, and NHTSA specifically, is heading toward a more responsive regulatory approach that is more suitable for accelerating the safe deployment of highly autonomous vehicles on our nation's roads.

While these initial guidelines are not perfect, AT121.org believes the Department of Transportation should be commended for recognizing a number of critical issues that must become priorities for industry and government to safely deploy autonomous vehicles. We also commend the Department for its clear willingness to engage with both the traditional auto industry and technology sectors. We believe such an open and productive dialogue with all interested parties is the first step to evolving toward a much more responsive and effective regulatory framework than the existing model.

Specifically, there are several positive provisions included in this initial version of the AV policy. First, the Department's 15-point safety assessment covers all the major key areas that are critical to the safe design of highly autonomous vehicles. Second, the Department rightfully asserted its appropriate and exclusive role as the nation's vehicle safety regulator and offered a model policy that can help guide states in formulating appropriate regulatory frameworks. Lastly, the Department was quite clear that it intended this process to be iterative and recognized the need to evolve and even adopt new regulatory models that could keep pace with the innovation cycle. We believe these are all excellent first steps in developing an appropriate regulatory framework.

There are however two sections of the AV Policy document that gave us pause. Specifically, the section on the use of existing regulatory tools and the examples given as possible future regulatory approaches is no better and potentially worse than the existing tools.

Although the policy includes language about revising and streamlining processes related to interpretations and waivers, we believe the underlying Federal Motor

Vehicle Safety Standards (FMVSS), while arguably effective for traditional motor vehicle design approval, will prove to be an unworkable foundation for accelerating the design and deployment of highly autonomous vehicles. As was highlighted in the March 2016 report by the Volpe National Transportation Research Center, there are considerable challenges in applying these standards to SAE level 4 and 5 autonomous vehicles.<sup>12</sup> For example, the FMVSS makes more than 250 individual references to human drivers, and eliminating traditional design features such as steering wheels and pedals, which can be anticipated in level 4 and 5 vehicles, would violate roughly a third of the standards and half of the Series 100 crash avoidance requirements.

While we commend the Department for beginning what we believe is a long overdue conversation on the need to create a much more responsive and timely regulatory approach, we believe the examples offered such as pre-approval of designs based on the FAA model or the FDA medical device approach are neither particularly efficient nor applicable or fitting.

Data is the key to reforming the regulatory process in a manner that will allow the creation of a regulatory approach that is rapid, efficient, and effective. Specifically, a central repository for collecting, storing, and analyzing all operational and testing data from across the industry is necessary to create a responsive regulatory environment. Neither the NHTSA nor any existing industry group is positioned to perform this task. Consequently, we are recommending the establishment of an independent, federally chartered organization to securely and confidentially collect and analyze all operational and test data from across industry that will include simulation data. By collecting real-time data and applying modern analytical methods, we are confident that, if properly established, this organization can rapidly inform industry and NHTSA of real and potential issues. We recommend that this effort be funded from existing dollars. We would be happy to consult with the Subcommittee on the specific details of this recommendation.

The second area we would like to highlight in our testimony this morning is our call for a *National Strategic Framework to Advance Life-Saving Self-Driving Vehicles*. We created this document calling for presidential level leadership on self-driving.

Accelerating the path to self-driving is an enormously complex undertaking that will go beyond the responsibility of the U.S. Department of Transportation. While there are major roles and policy levers that both the federal government as a whole and U.S. Department of Transportation can take to accelerate deployment and ensure that only safe vehicles make it to market, it is critical that all levels of government

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<sup>1</sup> John A. Volpe National Transportation Systems Center, *Review of Federal Motor Vehicle Safety Standards (FMVSS) for Automated Vehicles*, Preliminary Report-March 2016, prepared for the Intelligent Transportation Systems Joint Program Office, NHTSA.

<sup>2</sup> Levels of driving automation are defined in the SAE International Standard J3016. It identifies six levels of driving automation from “no automation” (0) to “full automation” (5), with level 4 being “high” and Level 5 being “full.”

work together, that industry and the research community continues to drive innovation and has a path to market, and perhaps most importantly that citizens are informed, engaged and welcoming of what will prove to be a major cultural shift.

Not unlike past transitions to transportation-related innovation, success will depend on high levels of cooperation and engagement across government, industry, and the public. This was true of steamships, railroads, motor vehicles and aviation. The disruptive transition to self-driving will require similar coordination, cooperation, and support.

As is true with all disruptive innovation throughout history, we can expect to experience both positive and negative effects as we begin integrating autonomous vehicles onto the nation's roads. It is critical that we thoughtfully consider the obvious consequences, both good and bad, that will undoubtedly arise from our transition from what we refer to as the "crash economy" to a new mobility paradigm.

As I mentioned earlier, the major reason for making this transition is to save lives and reduce injuries. Last year, over 35,000 Americans died in car crashes. This year that number is expected to climb and may exceed 40,000. Millions more are injured including many with life-changing debilitating injuries. We know that crashes cost the U.S. economy almost \$1 trillion annually. Let us be clear, we would not tolerate such cost and carnage in any other mode of transportation, and now, the tools are arriving to make these tragedies preventable.

Autonomous features and ultimately self-driving vehicles hold promise to dramatically reduce fatalities and injuries as NHTSA estimates that more than 94 percent of these crashes are the result of human error. We simply should not allow more than 90 of our fellow citizens to die every day when we can create the conditions to prevent it. The sooner we fully integrate autonomous vehicles onto our highways, the sooner we will realize a dramatic reduction in the number of preventable fatalities and injuries.

Getting this transition right will not be easy. Moving from the crash economy to a dramatically safer, accessible, affordable, and convenient mobility paradigm is a complex undertaking requiring unprecedented cooperation and coordination among industry, associations, and research and government institutions at all levels. We believe such an effort will require presidential leadership and that the incoming administration and Congress should work in concert to create the conditions necessary to accelerate the development, testing, and deployment of these capabilities as well as proactively address some of the anticipated consequences of transition.

At AT121.org, we announced the publication of our initial framework for accelerating the deployment of self-driving vehicles last month. The framework is not a prescriptive list of recommended actions but rather an outline of key

challenges areas that must be addressed in order to accelerate the integration of autonomous vehicles on our nation's highways.

Between now and Inauguration Day, we will be soliciting reaction to the challenge areas and hosting a series of expert panels to explore and produce recommendations on each challenge area. We intend to update the framework based on panel input and host a final review and input session for the entire document on January 4<sup>th</sup> with the Consumer Technology Association in advance of the Consumer Electronics Show.

In short, ATI21.org is calling for a National Strategy to Advance Self-Driving (NSAS) and urging the next president to issue an executive order that would describe the challenges and create a Program Management Office (PMO) within the Office of Science and Technology Policy (OSTP). We recommend funding the activity as a government-wide technology initiative through existing Office of Management and Budget (OMB) authority under a provision in the Clinger-Cohen Act. The PMO would operate under a four-year charter to collaborate with relevant stakeholders, assemble experts, develop outcome-focused and actionable strategies, and identify funding streams to address each of the challenge areas.

We have identified the following challenge areas:

1. Earning public trust
2. Increasing confidence in self-driving technology
3. Ensuring robust cybersecurity
4. Developing standards and regulations that encourage self-driving
5. Creating the legal, liability, and insurance framework for accelerating the deployment of self-driving vehicles
6. Adopting reasonable data and privacy policies
7. Accelerating the transition to a fully self-driving fleet
8. Understanding and planning for economic disruption and labor transition

As we say in the framework, accelerating the path to self-driving will not be easy. The incoming president by leading us through this ambitious effort early in the new term can ensure dramatic progress toward creating a new mobility paradigm that will create safe, convenient, resilient, and accessible transportation options to all Americans regardless of their ability, age, or economic condition. ATI21.org believes this is a transportation legacy that we can be proud to leave to future generations.

In the coming months, we look forward to working with the Subcommittee and Congress to work on creating the conditions necessary to speed integration of autonomous vehicles on the nation's highways.

Thank you. I look forward to answering your questions.