

**Joint Statement of
Ford Motor Company and ARGO AI**

**Commonwealth of Pennsylvania
House and Senate Committees on Transportation
Hearing on
“Highly Automated Vehicles Testing Legislation”**

March 21, 2017

Ford Motor Company and ARGO AI believe automated vehicles have significant potential to improve mobility and safety. Our companies are hard at work to achieve the goal of deploying a Society of Automotive Engineers (SAE) Level Four vehicle without a steering wheel or accelerator and brake pedals for commercial applications in geo-fenced areas in 2021. To that end, Ford recently announced it will invest \$1 billion over the next five years in ARGO AI, which will help build the virtual driver system for future Ford automated vehicles. Our partnership’s development work will continue in Pittsburgh, where ARGO was founded, but its viability there will hinge on having the right policies in place to facilitate, rather than impede, innovation.

We acknowledge the hard work the General Assembly, PennDOT, and other stakeholders have invested in producing SB 427. Nevertheless, we are quite concerned that the bill contemplates rather complex testing requirements and does not provide a clear path for automated vehicle deployment in the near term. In Ford’s and ARGO’s collective view, neither of these potential outcomes will produce an environment conducive to advancements in automated vehicles in the Commonwealth of Pennsylvania.

Ford and ARGO echo many of the concerns with SB 427 shared by others providing testimony. In particular, the bill employs unique definitions of automated vehicle-related terms rather than making use of those more widely accepted by SAE. Further, SB 427 – as mentioned – is limited to automated vehicle testing. The bill’s testing requirements are unduly restrictive (*e.g.*, requiring a human in the driver’s seat for Level Four vehicles and permitting PennDOT to set a cap on the number of permits issued in the first two years), are additionally burdened by an unclear application process, and do not appear to contemplate reasonable exceptions to federal and state laws. Finally, the SB 427 would grant wide-ranging authority to PennDOT to issue a statement of policy related to automated vehicles, which ultimately may result in additional regulatory mandates that could stymie the testing and deployment of automated vehicles.

While we appreciate the intention of certain sections of SB 427, such as its prohibition on local ordinances and consideration of reciprocal agreements with other jurisdictions, we regret that we cannot support the bill at this time. Ford and ARGO strongly believe that if the Commonwealth does pursue legislative or regulatory action with respect to automated vehicles, such action should be premised upon removing impediments to the safe testing and deployment of such vehicles. In closing, Ford and ARGO would be pleased to collaborate with the Commonwealth to that end and would welcome the opportunity to help craft reasonable policies to ensure a safe, competitive future for automated vehicles.

We are stepping into a new era of transportation for roadway vehicles. Technology in road transportation is evolving rapidly – particularly with respect to automated vehicles. It is imperative that as the Nation’s vehicle safety experts, we are on the forefront of knowledge about advanced automated vehicle safety technologies and support the safe integration of such designs and systems into the changing mobility environment.

At the Department of Transportation (DOT), safety is paramount and remains both the Department’s and the National Highway Traffic Safety Administration’s (NHTSA) number one priority. NHTSA’s mission is to save lives, prevent injuries, and reduce economic costs due to road traffic crashes, through education, research, safety standards and enforcement activity. DOT and NHTSA want to help ensure that automated vehicle technologies reach their full potential and deliver on their safety promise. We believe technology and safety go hand in hand. In fact, NHTSA has always pursued technology solutions as a tool to reduce the societal impact of crashes as we look to reach our goal of Zero roadway fatalities.

While we have made great progress in roadway and motor vehicle safety, the current trend of roadway fatalities is a reminder that much work remains. After seeing fatalities decrease for decades, we’ve seen an alarming increase in fatalities over the past few years. At 35,092 fatalities in 2015, the nation experienced a 7% increase in motor vehicle traffic fatalities from the previous year. Similarly, for the first 9 months of 2016, estimates show an 8% increase over the first 9 months of 2015. The trend of increasing fatalities must be reversed as each life is precious.

With data showing 94% of crashes associated with human error, vehicle automation and driver assistance safety technologies can support the driver and prevent or mitigate crashes. This is possible through systems that correct human mistakes or technology that assumes full driving responsibility for the driving task. We’re seeing examples of this even today with technology such as automatic emergency braking. This automated technology can mitigate or completely avoid a rear-end crash if a human driver fails to engage the brakes fully or at all given a pending collision. Automated vehicles could offer even more potential for reducing crashes and saving lives when used in conjunction with other revolutionary technologies such as V2V or V2I, also known as connected vehicle technologies.

But even beyond the potential safety value, automated vehicles offer additional benefits. They can increase mobility for certain populations and geographic areas. Consider the benefits of automated vehicles for our elderly and disabled communities that may otherwise be restricted in travel due to physical constraints or limitations – able to safely, easily, and comfortably travel to doctors and family and recreational activities. They also offer the potential to substantially reduce or eliminate fatalities and injuries resulting from human error.

Likewise, automated vehicles can ease congestion, promote new private and public ride share options, and reduce emissions.

The U.S. has seen remarkable progress towards implementation of automated vehicles and DOT and NHTSA stand ready to support the innovation. Our first step was the release of the Federal Automated Vehicles Policy (the Policy) on September 20, 2016. The Policy serves as an initial framework and recitation of best practices to guide manufacturers and other entities in the safe design, development, testing, and deployment of vehicle automation. Its development was informed by significant public input gathered through public meetings and collaborative efforts with stakeholders. The Policy is intended to encourage greater coordination with stakeholders, continual input from interested parties, steadied learning about technologies, while also offering current best practices and fine-tuning these practices as we, as a community, learn more about automated vehicles.

An additional goal of the policy is to build and promote public acceptance which is critical if automated systems and vehicles are to succeed. Trust is required between the public and entities looking to test and deploy automated vehicles. Additionally, a thorough understanding of the technology is required for States to implement programs or accommodate automated vehicles on their roadways.

The Policy divides the task of facilitating the safe introduction and deployment of automated vehicles into four sections:

- Vehicle Performance Guidance
- Model State Policy
- NHTSA's Current Regulatory Tools
- Modern Regulatory Tools

The Vehicle Performance Guidance for Automated Vehicles section outlines best practices for testing and deployment of automated vehicles. At the heart of the Vehicle Performance Guidance is a 15-point safety assessment letter to aid NHTSA and the public in keeping abreast of automated vehicle activity and also to assist in informing the public about how entities are going to safely test and deploy these vehicles. It is the beginning of the discussion between manufacturers and other entities with NHTSA – a chance to ask questions about safety, cybersecurity, and operating design domain, to name but a few of the areas to be covered in the Safety Assessment Letter.

These Safety Assessment Letters, while voluntary, are the mechanism NHTSA is utilizing to build public trust and confidence in Agency safety oversight efforts of the technology, while exercising “regulatory humility” in the spirit of pro-innovation. To date, NHTSA has received

clearance from the White House's Office of Management and Budget to collect data from entities through the Safety Assessment Letter and has released templates to offer guidance to entities on the format and type of information we are looking to receive.

The second section, Model State Policy, discusses the roles of the federal versus State Governments. This section sets forth the goal of establishing a consistent national framework rather than a patchwork of incompatible laws. It clearly delineates the division of regulatory responsibility for motor vehicle operations, with States maintaining their traditional responsibilities for licensing and registration, traffic laws and enforcement, and motor vehicle insurance and liability, while NHTSA responsibilities remain setting Federal Motor Vehicle Safety Standards and ensuring their enforcement and compliance.

The Model State Policy was a collaborative effort with many stakeholders including the American Association of Motor Vehicle Administrators (AAMVA). NHTSA continues to be engaged with AAMVA in discussions and activities. The Agency appreciates the involvement of the States in this manner to increase the purpose and scope of federal and State activity, while also coordinating to ensure sufficient consistency of laws and policies to not impede innovation and support the expeditious and widespread distribution of safety enhancing automated vehicle technologies.

The third section outlines how manufacturers and other entities could better use NHTSA's current regulatory tools to support the deployment of new technologies. It also outlines for the public NHTSA's enforcement authority. Under current regulations for motor vehicles, some entities may request interpretations or exemptions from compliance under certain circumstances. These requests are beneficial to both the entities in search of clarification or increased testing opportunities, as well as NHTSA in identifying regulatory language that may serve as an obstacle for advanced and innovated technology solutions.

Likewise, this section details NHTSA's current processes for evaluating and responding to interpretations, exemptions, and rulemaking requests and suggested means to streamline and increase the speed at which NHTSA responds to requests regarding automated vehicles. An additional tool we can currently utilize is the defects and enforcement authority, which was emphasized concurrently with the release of the Policy in NHTSA Enforcement Guidance Bulletin 2016-02: Safety-Related Defects and Automated Safety Technologies. Together, these tools provide increased assurance to the public and help to hold the entities accountable for the safety of the automated vehicles and equipment they are testing or deploying.

The last section of the Policy is a catalyst to begin conversation – offering up new tools and authorities to account for the changing environment and development of automated vehicles. For example, the manner in which automated vehicle functions can be updated is different –

capable of updating over the air rather than at a brick and mortar business, thus taking the need for human interaction out of the loop. These updates alter the vehicle after manufacture and initial certification, but could involve highly automated functions that have subsequent impacts. NHTSA looks forward to engaging with stakeholders, academia, advocacy groups, and judicial experts to further discuss these options.

So why is NHTSA part of today's discussion? Various States have been looking to the Agency to further define their roles, searching for more clarity with respect to specific legislative activity. With that in mind, we would like to reiterate the activities that States can and should begin working on now: reviewing legislation to determine what regulatory barriers might preclude testing and deployment in that State; setting up committees and lead agencies to be involved in the considerations for testing requirements not related to the design of the vehicle, and; developing processes for applications for testing and determining jurisdictional permission.

We emphasize the need for the regulatory environment to remain flexible and nimble as automated technologies evolve –and for States to understand the need to remove regulatory barriers that may exist while not, albeit unintentionally, creating new barriers by too quickly enacting legislation regarding testing and deployment.

We strongly encourage States to allow NHTSA alone to regulate the performance of automated technology and vehicles. If a State does pursue automated vehicle performance-related regulations, that State should consult with NHTSA and base its efforts on the Vehicle Performance Guidance provided in the Policy. NHTSA is prepared to assist with challenges that States face with regard to automated vehicles both now and in the future. States are also encouraged to work with their municipalities to help them address their unique challenges and concerns. Both are encouraged to review their traffic safety regulations for any impediments to technology innovation.

The DOT Federal Automated Vehicles Policy is guidance to foster the evolution of innovation. It was released to help prepare the Nation for the transportation systems of the future by considering new technologies and the modernization and rebuild of our infrastructure. It does not regulate out of the gate – thus slowing innovation, stifling creativity, and hence limiting its life-saving potential and the mobility options it presents.

However, NHTSA remains a data-driven agency. The effort to develop and release a thorough and inclusive Policy for automated vehicles was a first step, but not the final word. The next iteration of the Policy will build upon new knowledge of automated safety systems and the safety of such systems on our roadways.

We look forward to continued engagement with all stakeholders, including our State partners to enhance our guidance in the future. We also welcome the opportunity to use any

information we gather from the implementation of the Policy to inform and educate the public about automated vehicles. The Agency is currently evaluating public comments from the docket, along with feedback received from the various public meetings already held and will be discussing with Secretary Chao to incorporate her guidance into NHTSA's next steps.



JOINT HEARING ON HIGHLY AUTOMATED VEHICLES



Senate and House Transportation Committees – Joint Hearing “Highly Automated Vehicles (HAV) Testing Legislation” PROPOSED QUESTIONS TO TESTIFIERS

HAV Systems and Robotics Engineering:

- Can you describe the process on how H-A-Vs are programmed to make ethical decisions regarding the dynamic driving task?
- How safe would you describe the cybersecurity measures of these H-A-Vs and what else could be done to enhance the security of H-A-Vs, either legislatively or by the manufacturer?
- Based on your experience, what are the major hurdles in developing H-A-V technology?
- In your opinion, how soon will H-A-Vs be ready for commercialized deployment and available to be purchased by consumers?
- Can you describe how H-A-Vs will interact on the roadways with other vehicles, pedestrians, etc.?

National Perspective on HAV Testing:

- Can you elaborate on the role of the states as delegated by the National Highway Traffic Safety Administration's federal automated vehicles policy?
- Do you believe the federal automated vehicles policy will change under the Trump Administration?
- What are the key elements that need to be in Pennsylvania's H-A-V testing legislation?
- For states that passed H-A-V testing legislation, what state(s) has the best and worst model legislation?
- Recognizing that states can create different policies as suggested in the federal automated vehicles policy, what constraints should states employ to ensure uniformity is maintained across the country?

State Perspectives on HAV Authorization and Testing:

- Can PennDOT describe what information will be collected during the application process as well as when the H-A-Vs will be tested on the Commonwealth's roadways?
- Can PennDOT describe why the Statement of Policy is preferred over regulations?
- Can PennDOT elaborate on what other policies would be developed as part of the Statement of Policy not currently included in Senate Bill 427?
- Can PennDOT describe how the agency is prepared in terms of providing technical expertise on governing H-A-Vs and what resources are available or are needed to enhance the Commonwealth's transportation system to interact with H-A-Vs?

State Perspectives on HAV Authorization and Testing (cont'd):

- Can the State Police identify what the protocol would be if an H-A-V was involved in a reportable accident, whether the vehicle includes or does not include a human operator?
- Can the State Police describe the resources needed at the state and local enforcement levels to ensure the safe testing of H-A-Vs on our roadways?
- Can the State Police justify testing H-A-Vs on our roadways without a human operator physically seated in the vehicle?

HAV Testing – “Roundtable Discussion”:

- Why is Pennsylvania an attractive place for investing in H-A-Vs? Is Pennsylvania in competition with other states for attracting investments by manufacturers?
- For states that passed H-A-V testing legislation, what state(s) has the best and worst model legislation?
- Do you believe that Senate Bill 427 should address the deployment of commercialized H-A-Vs for sale to consumers?
- How would you describe the process for identifying and selecting test operators to drive your H-A-V?
- Do you believe that testing H-A-Vs should have any restrictions while being tested on roadways throughout the Commonwealth?
- What do you like most and least about Senate Bill 427?
- If Senate Bill 427 was passed today, would you be inclined to invest or divest in Pennsylvania?
- If you are currently testing in Pennsylvania or beyond, can you describe how often the test operator had to intervene or takeover the H-A-V during the testing? What would you consider to be a good or bad metric on managing miles-per-intervention?

Insurance Perspective on HAV Testing:

- Are insurance companies already providing coverage to automated vehicle testers in Pennsylvania?
- With the introduction of H-A-Vs on Pennsylvania's roadways, does the typical consumer need to have any additional insurance coverage?
- Since other states have enacted legislation to allow for H-A-V testing, can you address whether insurance companies in those states have changed policies for consumers?
- What should be the typical insurance coverage by automated vehicle testers?
- How would you describe the feasibility of the liability section in Senate Bill 427?



JOINT HEARING ON HIGHLY AUTOMATED VEHICLES



Senate and House Transportation Committees – Joint Hearing
“Highly Automated Vehicles (HAV) Testing Legislation”
TALKING POINTS – [Senate Bill 427](#), Printer's No. 396

Highway Safety Measures:

- No person shall test HAVs or platooning on roadways unless **approval is received by PennDOT** and the automated vehicle tester possess a permit, HAV identification and the statement of policy.
- A **test operator** employed by, authorized by or affiliated with an automated vehicle tester must meet certain qualifications such as training, a valid driver's license and a background check.
- A test operator is required to **continuously monitor the testing** and be immediately available to perform a driving task with or without being physically seated in the driver's position of the HAV.
- All applicable **federal and state laws and regulations** as well as applicable state and local traffic laws, state motor vehicle laws and state and local traffic-control devices shall be followed.
- If an HAV is involved in a **reportable accident**, the automated vehicle tester must submit a self-certification to PennDOT on how the HAV will be reinstated for testing purposes.
- PennDOT must work in collaboration with automated vehicle testers (and vice versa) if there are any **cybersecurity intrusion attempts** with connected infrastructure.
- Every two years, PennDOT must conduct an **audit procedure** of every approved automated vehicle tester including the demonstration of HAVs or platooning.
- **Liability** remains with either the test operator or the automated vehicle tester, not the HAV.
- The number of motor vehicles in **platooning** shall be limited and determined by PennDOT.
- A **variety of penalties** shall be imposed for violations of S.B. 427 such as permit noncompliance, traffic violations and evidence of unsafe or unfit conditions.
- A **Highly Automated Vehicle Safety Advisory Committee** is established to continuously monitor HAV testing, public education and training for emergency service responders and law enforcement.

Economic Competitiveness Measures:

- Approved automated vehicle testers may test the **most advanced HAVs** (Levels 3, 4 or 5) with or without a test operator physically seated in the driver's position of the HAV.
- Any HAV or motor vehicle in platooning may involve a **test passenger** who is authorized by, employed by or affiliated with an automated vehicle tester.
- Current or potential automated vehicle testers are allowed to **submit feedback** on PennDOT's application process and PennDOT's statement of policy.
- Current or potential automated vehicle testers legally testing in Pennsylvania prior to the Act have up to **1 year to comply** with the Act.
- Notwithstanding any other provision of law, automated vehicle testers are **not subject to any limitations or restrictions** to testing, unless testing encompasses motor vehicles in platooning.
- Automated vehicle testers are **not subject to any reporting**, unless there is a reportable accident.
- PennDOT shall issue a **statement of policy**, not regulations, regarding the provisions of S.B. 427, which must be consistent with guidelines from the National Highway Traffic Safety Administration.
- Notwithstanding any other provision of law, information submitted by automated vehicle testers to PennDOT shall be **proprietary and may not be disclosed** to any third party.
- S.B. 427 supersedes and **preempts all local ordinances** of a municipality regarding HAV testing.
- PennDOT may enter into **reciprocal agreements** with other states and countries for testing purposes to enhance the safety and economic development of HAVs and platooning.

Comparison of Enacted Legislation on Highly Automated Vehicles (HAV) and Platooning Testing:

Component	S.B. 427	AL	CA	FL	LA	MI	NV	ND	TN	UT	VA	D.C.
Definition of HAV or HAV System	X		X	X	X	X	X	X	X	X		X
Application for Testing Authorization	X		X						X			
HAV Sticker or Plate	X					X						
Audit of Permit Compliance	X											
Automated Vehicle Tester and/or Test Operator Requirements	X			X			X		X			
HAV Requirements				X			X		X			X
Front-Seat Electronic Display				X					X		X	
State DOT Reporting Needs	X			X		X		X		X		
HAV Reporting Requirements			X			X			X			
Cybersecurity Provisions	X											
Safety and Emissions Inspections	X											
Titling and Registration	X											
Liability	X			X		X	X		X			X
Regulatory Authority			X				X		X			X
Penalties and Fines	X											
Tax (Per Mile Travelled)									X			
Platooning	X			X		X				X		
Advisory Committee	X	X				X						

*The analysis was conducted by the Senate Republican Research Office based on legislation collected by the National Conference of State Legislatures.

**The analysis excludes executive orders from Arizona and Massachusetts.

***All of the states and Washington, D.C., enacted legislation prior to the National Highway Traffic Safety Administration's DRAFT federal automated policy in 09/16.

National Highway Traffic Safety Administration's (NHTSA) DRAFT Federal Automated Policy – Model State Policy Guidance:

- NHTSA's responsibilities include: 1) Setting Federal Motor Vehicle Safety Standards (FMVSS) for new motor vehicles and motor vehicle equipment (to which manufacturers must certify compliance before they sell their vehicles); 2) Enforcing compliance with the FMVSS; 3) Investigating and managing the recall and remedy of non-compliances and safety-related motor vehicle defects and recalls on a nationwide basis; 4) Communicating with and educating the public about motor vehicle safety issues; and 5) Issuing guidance for vehicle and equipment manufacturers to follow, such as the Vehicle Performance Guidance for HAVs.
- States' responsibilities include other aspects of motor vehicle regulations: 1) Licensing (human) drivers and registering motor vehicles in their jurisdictions; 2) Enacting and enforcing traffic laws and regulations; 3) Conducting safety inspections, where States choose to do so; and 4) Regulating motor vehicle insurance and liability.
 - States may still wish to experiment with different policies and approaches to consistent standards, and in that way contribute to the development of the best approaches and policies to achieve consistent regulatory objectives.
 - NHTSA believes that eventually there should be a consistent set of laws and regulations governing the testing and operation of HAVs.

HIGHLY AUTOMATED VEHICLES SHOWCASE

WHEN

**Tuesday, March 21st
8:30am-1pm**



WHERE

North Street

Between the North Office Building and the Keystone Building



WHO

**Carnegie Mellon University &
Uber**

Legislators and staff, Commonwealth employees, media and other interested persons are encouraged to see the HAV models showcased by Carnegie Mellon University and Uber.

Organized by the Senate and House Transportation Committees, in conjunction with the Joint Hearing on "Highly Automated Vehicles Testing Legislation", Tuesday, March 21, 2017, Hearing Room 1, North Office Building, 9:30am-12:30pm.