COMMONWEALTH OF PENNSYLVANIA
HOUSE OF REPRESENTATIVES

HOUSE TRANSPORTATION COMMITTEE

joint with the

SENATE TRANSPORTATION COMMITTEE
PUBLIC HEARING

STATE CAPITOL
HARRISBURG, PA

NORTH OFFICE BUILDING
HEARING ROOM 1

TUESDAY, MARCH 21, 2017
9:30 A.M.

PRESENTATION ON
HIGHLY AUTOMATED VEHICLES (HAV) TESTING LEGISLATION

HOUSE COMMITTEE MEMBERS PRESENT:
HONORABLE JOHN TAYLOR, MAJORITY CHAIRMAN
HONORABLE ROSEMARY BROWN
HONORABLE LYNDA SCHLEGEL CULVER
HONORABLE MINDY FEE
HONORABLE KATE HARPER
HONORABLE JOHN LAWRENCE
HONORABLE JIM MARSHALL
HONORABLE MICHAEL PEIFER
HONORABLE MARGUERITE QUINN
HONORABLE MICHAEL REESE
HONORABLE GREG ROTHMAN
HONORABLE WILLIAM KELLER, DEMOCRATIC CHAIRMAN
HONORABLE MARIA DONATUCCI
HONORABLE WILLIAM KORTZ
HONORABLE ROB MATZIE
HONORABLE ED NEILSON
HONORABLE PERRY WARREN
SENATE COMMITTEE MEMBERS PRESENT:
  HONORABLE JOHN C. RAFFERTY, MAJORITY CHAIRMAN
  HONORABLE CAMERA BARTOLOTTA
  HONORABLE MARIO M. SCAVELLO
  HONORABLE PATRICK J. STEFANO
  HONORABLE RANDY VULAKOVICH
  HONORABLE JOHN P. SABATINA, JR., DEMOCRATIC CHAIRMAN
  HONORABLE JAMES R. BREWSTER

*****
Pennsylvania House of Representatives
Commonwealth of Pennsylvania
HOUSE COMMITTEE STAFF PRESENT:
  ERIC BUGAILE
    MAJORITY EXECUTIVE DIRECTOR
  GREG ROTHMAN
    MAJORITY RESEARCH ANALYST
  NANCY COLE
    MAJORITY ADMINISTRATIVE ASSISTANT
  MEREDITH BIGGICA
    DEMOCRATIC EXECUTIVE DIRECTOR
  KYLE WAGONSELLER
    DEMOCRATIC RESEARCH ANALYST

SENATE COMMITTEE STAFF PRESENT:
  NOLAN RITCHIE
    MAJORITY EXECUTIVE DIRECTOR
  CECILIA BOYER
    MAJORITY SECRETARY
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**SUBMITTED WRITTEN TESTIMONY**

* * *

(See submitted written testimony and handouts online.)
SENATE MAJORITY CHAIRMAN RAFFERTY: Good morning, ladies and gentlemen. I didn't bring my gavel so don't make me go get it. Good morning, ladies and gentlemen. Call to order the first joint hearing of the 2017/2018 session of the Senate and House Transportation Committees. The four Chairs welcome you. Senator Sabatina will be with us very shortly.

Chairman Taylor and Democratic Chair Keller and I, John Rafferty, welcome you to today's hearing. It's a quite lengthy agenda. As always, we'll continue to try to be on time.

If you feel like you would like to have got something in and we didn't give you the time, you can submit it to writing through the four Chairs' offices, and if there's questions that the Members didn't get to, they can submit them to us and we will get them to the respective testifiers and they can submit their testimony.

The purpose of today's hearing it to collect feedback on the HAV testing in Pennsylvania with a focus on Senate Bill 427. Senator Vulakovich is the prime sponsor of that bill. We've been working very closely with the City of Pittsburgh with some of this technology in their region. They've been at the forefront. And we'd like to
thank the City of Pittsburgh and Carnegie Mellon University for showcasing the HAVs outside on North Street until one o'clock today. Carnegie Mellon and Penn State University also have tables here in the hallway outside showcasing the HAV vehicles.

Note there's additional written testimony provided today by the National Highway Traffic Safety Administration, Pennsylvania AAA Federation, Ford Motor Company, and George Mason University. Pittsburgh was unable to be with us today, but again, we appreciate the city's cooperation in this regard on the HAV vehicles.

Pennsylvania is considered a national and international leader in HAV technology due to the significant advancements particularly in the Pittsburgh region. So commend western PA for their leadership.

This is a hearing. There'll be no action items taken. Members will be in and out all day. There are a bunch of other Committee meetings. In fact, at 11:30 this morning there are a number of us here on the panel who will leave to attend the Senate Judiciary Committee meeting, myself included, and will return for the balance of the hearing. So thank you for your cooperation and your patience.

The Chair recognizes Senator Taylor -- I'm sorry, Representative Taylor. You know, I demoted you there. I
HOUSE MAJORITY CHAIRMAN TAYLOR: Good morning, everyone. Thank you, Senator Rafferty. We're glad to be here with you and your Senate colleagues.

This is an issue that we've been exposed to a little bit last session. In the House we had Representative Marshall's bill. We've all been in various phases of watching testing and being at CMU over the years. I think it's now time for Pennsylvania to get down to business to get some clear guidelines of what we can and can't do.

On our Committee, to show you how we're always trying to catch up with the times in terms of Committee structure, we don't have a Subcommittee on this technology. If we did, our colleague, Representative Rothman, would be that guy. He's got a particular interest, and I'm sure you'll hear from him in a variety of ways with some questions as we move forward. He's going to be one of the Members we rely on on this issue.

But with that, Senator, thanks.

SENATE MAJORITY CHAIRMAN RAFFERTY: Thank you, Chairman.

Chairman Keller.

HOUSE DEMOCRATIC CHAIRMAN KELLER: Thank you, Senator. I also want to thank you for having this hearing.
You know, the purpose of hearings are to educate the Members, and for one, I'm one Member that really has to be educated on this. This new technology I think it's the future in transportation, and I'm very glad we're here today. And hopefully, we'll learn a lot today from this hearing. Thank you.

SENATE MAJORITY CHAIRMAN RAFFERTY: A few comments. The prime sponsor of Senate Bill 427, Senator Vulakovich.

SENATOR VULAKOVICH: I think just glad to be here today to learn a little bit to get the discussion further along, move it further along. We got a bill out there, myself and Representative Marshall. We'll work together on this piece of legislation. It's very important for the future. And we'll see where we can come together.

So with that, because of limited time, you know, Mr. Chairman, we have to leave maybe before it's over and the House has session at 11:00. So I'm going to save my remarks for later on. Thank you.

SENATE MAJORITY CHAIRMAN RAFFERTY: The Chair thanks the Senator.

Before we begin, we will bring up a number of people together for panel discussions. You make sure you hit the button. The green light goes on your microphone. That way everybody's happy we can hear you. And before we
begin though with that, we're going to ask the Members to introduce themselves. I'll begin with Representative Harper if you would, please.

REPRESENTATIVE HARPER: Representative Harper, 61st District, Montgomery County.

REPRESENTATIVE FEE: Representative Mindy Fee, 37th District, northern Lancaster County.

REPRESENTATIVE CULVER: Representative Lynda Culver, Northumberland and Snyder Counties.

REPRESENTATIVE REESE: Representative Mike Reese, 59th Legislative District, including portions of Westmoreland and Somerset Counties.

REPRESENTATIVE MARSHALL: Representative Jim Marshall, 14th District, Beaver and Butler Counties.

REPRESENTATIVE MATZIE: Rob Matzie, 16th District, Beaver and Allegheny County.

REPRESENTATIVE KORTZ: Good morning. Representative Bill Kortz, 38th District, Allegheny County.

REPRESENTATIVE DONATUCCI: Good morning. Maria Donatucci, 185th District, Philadelphia and Delaware Counties.

HOUSE DEMOCRATIC CHAIRMAN KELLER: Good morning. Bill Keller. I represent the 184th District in south Philadelphia.

HOUSE MAJORITY CHAIRMAN TAYLOR: Chairman John
Taylor, Philadelphia.

SENATE MAJORITY CHAIRMAN RAFFERTY: Chairman John Rafferty, 44th Senatorial District.

SENATOR VULAKOVICH: Senator Randy Vulakovich, Allegheny County, which includes the City of Pittsburgh.

REPRESENTATIVE ROTHMAN: Representative Greg Rothman, the 87th District, Cumberland County.

SENATOR STEFANO: Senator Pat Stefano, 32nd District, Fayette, Somerset, and Westmoreland Counties.

REPRESENTATIVE BROWN: Good morning.

Representative Rosemary Brown, 189th District, Monroe and Pike Counties.

REPRESENTATIVE WARREN: Hi. Representative Perry Warren, 31st District, Bucks County.

SENATE MAJORITY CHAIRMAN RAFFERTY: Thank you all very much. Our first testifier is Dr. -- if I mispronounce, please let me know -- Raj Rajkumar. Did I do it right, Doctor?

DR. RAJKUMAR: Yes.

SENATE MAJORITY CHAIRMAN RAFFERTY: Thank you. Please. The doctor is a Professor of Electrical and Computer Engineering Department of Robotics Institute, Carnegie Mellon. Thank you, Doctor. If you will.

DR. RAJKUMAR: Chairman Rafferty, Chairman Taylor, Chairman Keller, and respected Members of the joint
Committee, it is an honor to be here to give you my testimony.

Automobiles are an integral part of our society and economy. Highly automated vehicle technologies are expected to yield major societal benefits. About 42,000 people died from automotive crashes in the U.S. last year with 94 percent of these crashes attributable to human error. If vehicles drive themselves, they will not be distracted, and the number of crashes, injuries, and fatalities is expected to drop dramatically.

Secondly, the average American commutes to and from work 51 minutes every workday, and we are simply stuck in traffic for about 35 hours per year on the average. If our vehicles can be self-driving, we can enjoy the benefits of a virtual chauffeur and be productive during our journeys.

The elderly often living alone, when they lose their driver's licenses also lose their mobility options, independence, and their quality of life. There are also 1.5 million legally blind and more than 5 million physically disabled people in the U.S. who cannot drive. These highly disadvantaged groups will benefit significantly from being able to travel independently.

Some of these benefits are many years away. However, highly automated vehicles will reduce the
intensity of crashes and their negative outcomes sooner
than many of us think.

Carnegie Mellon University has been a birthplace
of highly automated vehicles with work on campus dating
back to the early 1980s. CMU and Pittsburgh have occupied
a special place on the stage since then. Our team from CMU
won the 2007 DARPA Urban Challenge. This global
competition required vehicles without anybody in them to
travel 60 miles in fewer than six hours interacting with
other fully autonomous and human-driven vehicles while
following the rules of the road.

CMU has been working with General Motors R&D for
the past 17 years on making vehicles smarter and more than
10 years on vehicle automation. Google's project on self-
driving vehicles literally started when they hired a key
person from our CMU team and some experts from other teams.

Delphi, a global tier 1 automotive supplier
acquired a Pittsburgh startup county I founded named
Ottomatika, which developed AI software for self-driving
vehicles. Ottomatika continues to operate in Pittsburgh.

Uber came to Pittsburgh after recruiting
extensively at CMU and made Pittsburgh the first national
testbed for self-driving shared vehicles.

Ford recently announced up to a billion dollars
in investments in Pittsburgh's Argo AI, founded by a CMU
alumnus and an ex-employee.

Also, thanks to a proposal from CMU, there is now a Smart Belt Coalition that has brought together the States of Michigan, Ohio, and Pennsylvania with the goal of facilitating and deploying connected and automated vehicles that work seamlessly across State borders. Our collective mission is to change the longstanding narrative of a Rust Belt and transform our region into a Smart Belt.

We at CMU are also proposing a new center of excellence called CADRE, Connected and Automated Driving Research and Engineering. This center's goal is to develop the next generation of highly automated vehicles that use automotive-grade components with the same degree of safety, quality, and reliability that we expect when we buy a car today. Additional research and development, along with extensive testing, are required to reach this goal. A center for the future of work will also study the impact of automation on employment and propose remedies.

The Society for Automotive Engineers, SAE in short, has defined five levels of degrees of automation. Level 0 is no automation. A human driver is responsible for all vehicle operations.

Level 1 represents some driver assistance. Either acceleration or steering in specific driving contexts is performed by a driver assistant component in
the car. Cruise control is an example of level 1 operations.

   Level 2 represents partial automation. Both steering and acceleration are performed by the vehicle in specific driving contexts. Adaptive cruise control with lane-keeping on the highway is an example of this particular capabilities. The operator must explicitly intervene when necessary.

   Level 3 represents conditional automation. This vehicle drives itself completely in specific driving contexts, but a human is expected to intervene when called for. In other words, the human operator must be paying attention and be ready to grab control at any time.

   Level 4 represents high automation. The vehicle drives itself completely in particular driving contexts even if the human is not paying attention.

   Level 5 is full automation. The vehicle can drive itself completely from the starting point to the destination on all roads and under all environmental conditions that a normal licensed driver can handle. No human intervention or supervision is required.

There are three fundamental considerations for the Legislature. The first is public safety. Driving is a very complex activity where drivers consume and process enormous amounts of sensory information, make decisions,
and actuate the steering wheel and the pedals. We use experience, common sense, instincts, and planning. But we are also conditioned to be distracted. Technology can make up for more than our distractions but cannot match our other strengths for quite some time to come. The real-world complexity of different weather, lighting, and road conditions, as well as the dynamic chaos of urban traffic, can and does overwhelm today's technological capabilities.

The second is technological innovation. While there is quite some distance to reach full automation, we have come a long way since 2007's DARPA Urban Challenge. With the breadth and depth of activities at companies and universities like ours and in locations like Pittsburgh, innovation is progressing rapidly. PennDOT, for example, has been a national leader employing smart traffic light technologies out on the capital here and in Pittsburgh.

These traffic lights can talk to highly automated vehicles making traversal of accident-prone intersections safer and more reliable. This is referred to as vehicle-to-infrastructure technology, or V2I in short. Just like our phones and laptop computers can talk to each other wirelessly, vehicles can also talk to one another using vehicle-to-vehicle communications, or V2V. Up to 80 percent of automotive crashes can be prevented or at least mitigated using this technology. Vehicles would also be
able to talk to pedestrians, bicyclists, and their smartphones, improving safety for all. PennDOT is at this leading edge. Their continued deployments will make our transportation infrastructure smarter and safer.

The third is economic development. The market size for highly automated vehicles is conservatively estimated to be several hundreds of billion dollars per year. Pittsburgh was a birthplace of this technology, and we need to invest in and leverage this innovation culture to continue our renaissance. If the HAV ecosystem is not allowed to develop here in our State, it will happen elsewhere. In fact, Singapore became the first country on the planet to have the public ride self-driven taxis.

Highly automated vehicles require myriad components, sensors, computers, and software. These computers need to be built, tested, diagnosed, and repaired, creating many new higher-paying jobs. HAVs can also provide access to transportation to disadvantaged neighborhoods and rural communities, making our Commonwealth's cities smarter and communities more connected to opportunities. Better access to health care and higher safety would also be major benefits.

Let me make some recommendations if I may on legislation. First, we need to move in an enabling direction. Pennsylvania laws have enabled us at CMU to
test our self-driving Cadillac in Pittsburgh, Allegheny County, and in Harrisburg since 2011. It has been legal to do such testing as long as there is a licensed operator in the driver's seat. Without this framework, our development and testing would have been significantly hampered. Any new legislation that you pass must in the very least not take away this feature.

The question for the legislation is which additional new testing and deployment modalities should be permitted. On-road testing under real-world traffic conditions is absolutely essential to gaining experience and fixing problems.

Secondly, our Commonwealth institutions like CMU have been globally recognized leaders in HAVs and must continue to be. We can hold back and make testing and eventual deployment onerous or prohibited in our Commonwealth. Unfortunately, this will not stall the technology. There is intense competition from States like California, Nevada, and Michigan. California is actively considering allowing fully automated vehicles without any operator in the driver's seat. We will merely end up losing jobs and a large market. Conversely, we can move forward, be open to innovation. We must open up new markets, create new jobs, and emerge as winners in the aggregate.
Thirdly, and perhaps most importantly, HAV legislation would benefit tremendously from built-in flexibility. Since the technology is progressing rapidly, we will gain by not cornering ourselves into a rigid and inflexible position. We need to be able to relax constraints when the technology proves itself to be reliable. At the same time, if mishaps and harmful incidents occur more frequently than imagined, we may need to impose some restrictions.

The regulatory guidance issued by the U.S. Department of Transportation in 2016 called for the Federal regulatory framework to be updated every year. This was a conscious and deliberate attempt to be responsive to future developments. Similar flexibility here in Pennsylvania will be priceless.

In conclusion, HAV technology that our Commonwealth played a major role in creating and nurturing is expected to create big new markets. Any legislation must continue to enable this technology to be tested on public roads. A path can also be laid out for how the technology can be deployed in the due course of time. However, public safety cannot and should not be compromised. Rules, instead of being set in stone, can built in flexibility so that any restrictions can either be relaxed or strengthened as developments warrant.
I thank you for the opportunity and would be happy to answer any questions.

SENATE MAJORITY CHAIRMAN RAFFERTY: Thank you, Doctor. Thank you for that informative report.

Questions for the doctor?

Senator Vulakovich.

SENATOR VULAKOVICH: Good morning, Doctor.

Where do you think we stand as far as, you know, the area of Pittsburgh, for example, with CMU, the relationship that they have with Uber? Compare it to where they're at in California. You say they're already doing the same thing in California?

DR. RAJKUMAR: California has been very aggressive I guess because they have Silicon Valley out there. Pretty much all the global carmakers have a physical presence there, so California wants to continue to be perceived and in reality be the leading place for the development of this technology. What we would like to see happen is that Pennsylvania actually keep pace and then enable further testing on our roads so that the technology can actually blossom and we can leverage the benefits of what was created here.

SENATOR VULAKOVICH: Okay. One other question. Why do you think Uber came here and selected the City of Pittsburgh and to work with CMU?
DR. RAJKUMAR: My understanding of the history is the following, Senator Vulakovich: Uber at some point in time got worried that Google with all the investment they've been making in HAVs could actually get into the car-sharing space, and then they could actually literally eat Uber's lunch by getting into Uber's market. So they actually looked around, I believe, to basically look for expertise to develop their own in-house technology, concluded that Pittsburgh's the place to be thanks to CMU, hired about 42 people, 42 staff members from campus, and that's how they launched their Advanced Technology Center in Pittsburgh and became -- I guess started the first national testing of autonomous shared vehicles in Pittsburgh.

SENATOR VULAKOVICH: Okay. Thank you, Mr. Chairman.

SENATE MAJORITY CHAIRMAN RAFFERTY: You're welcome.

REPRESENTATIVE ROTHMAN: Thank you, Doctor. And we appreciate your testimony.

If we had the legislation in place, how far along are we in technology to get to a level 5 automation in Pennsylvania?

DR. RAJKUMAR: In my estimate, we are quite a few
years away. I guess I like to say about 10 years or so.

So I think full automation is quite a few years away
because driving is perhaps the most complex activity that
most adults on the planet engage in. There's a continuous
flow of huge volumes of information that we sense, and
we're actually processing the information, making
decisions, and then using our limbs to turn the steering
wheel and such. And then meanwhile, we actually use our
intuition, common sense when things happen that we have
never, ever seen before. So it's going to take quite some
time for us to teach our computers, program the computers
to basically do something similar but at the same time as
the level 3, level 4 technologies can actually begin to be
deployed in the coming years.

We already have high-end cars that can park
themselves. We already have capabilities from Tesla and
then GM will have a capability called super cruise where
the vehicle can drive itself on the highways with a human
paying attention. So I think we should be trying to
facilitate further deployments like those and accumulate
experience so that level 5 will be reached sooner rather
than later.

REPRESENTATIVE ROTHMAN: Thank you. Just one
comment. Earlier in your testimony you talked about 42,000
Americans dying. I just did some calculation. Even if you
use the 94 percent human error, that's the equivalent of a full 747 falling out of the sky and crashing every other day. And I think that this technology to save lives is huge, too. If that were the case, we would stop all air travel immediately and try to fix it.

So thank you for your testimony today.

DR. RAJKUMAR: Thank you, sir.

SENATE MAJORITY CHAIRMAN RAFFERTY: Thank you, Representative.

Chairman Keller.

HOUSE DEMOCRATIC CHAIRMAN KELLER: Thank you, Mr. Chairman.

Doctor, I'm surprised. I thought to reach level 5 it would be more than 10 years, so you're really on track for that 10-year mark?

DR. RAJKUMAR: I do agree, but I think technology has been progressing exponentially in the past several years, so we should basically allow this technology to gain a foothold.

I think there are really different degrees of deployment. You can imagine deployment happening in what are called geographically fenced regions where there are no pedestrians or bicyclists and the like. Deployment happens first there, and then maybe in rural areas and then wide-open areas like Arizona, Nevada, and I guess central
Pennsylvania. And then a later goal would be being able to
drive amidst the crazy taxis in downtown Manhattan during
peak hour. And then much farther away is basically driving
in countries like India and south Asia.

HOUSE DEMOCRATIC CHAIRMAN KELLER: Thank you.

One more question. Because this is all new technology and
a new type of vehicle, what type of insurance do you need
on the cars while you're testing them?

DR. RAJKUMAR: So right now basically actually we
carry our own insurance. So CMU basically -- having been a
pioneer in this space, we basically support the development
and the testing of the technology.

HOUSE DEMOCRATIC CHAIRMAN KELLER: You're self-
insured?

DR. RAJKUMAR: Correct.

HOUSE DEMOCRATIC CHAIRMAN KELLER: Thank you.

Thank you, Mr. Chairman.

SENATE MAJORITY CHAIRMAN RAFFERTY: You're
welcome, Representative.

Senator Stefano.

SENATOR STEFANO: Thank you, Mr. Chairman. Thank

you, Doctor.

Based on your levels of automation that you've
indicated, where do you think you're currently testing in
this 0 to 5? What level are you currently testing in, and
how long do you think we get to level 5 and beyond?

DR. RAJKUMAR: So these are definitions and they can be interpreted differently. Depending upon how you interpret, we are either in level 2 or level 3. I like to say basically with this really very complex, very broad spectrum, you could say we are at level 3.3, for example.

SENATOR STEFANO: All right. Thank you. Thank you, Mr. Chairman.

SENATE MAJORITY CHAIRMAN RAFFERTY: Thank you, Senator.

Any further questions?

Thank you, Doctor, for your testimony. We much appreciate it, and have a great day. And thank you for Carnegie Mellon being one of the premier leaders in this field. So thank you.

DR. RAJKUMAR: Thank you, Mr. Chairman.

SENATE MAJORITY CHAIRMAN RAFFERTY: Next to testify on a national perspective on HAV testing is Mr. Ben Husch. Ben is a Director of National Resources and Infrastructure Committee, National Conference of State Legislators. Welcome, sir. Please make sure you hit the button. A green light goes on, and we'll be ready to roll.

Thank you. The floor is yours, Ben.

MR. HUSCH: Chairman Rafferty, Minority Chairman Sabatina, Chairman Taylor, Democratic Chair Keller, and
Members of both the Senate Transportation Committee and
House Transportation Committee. Good morning and thank you
for the opportunity to speak with you today. I am Ben
Husch with the National Conference of State Legislatures.
I serve as the Policy Director for NCSL's Natural Resources
and Infrastructure Committee, which covers State-Federal
transportation public policy issues.

I'd like to take just a few minutes to give you
an update on what is going on across the country regarding
autonomous vehicles. I'd like to start with a quick
overview of what we are seeing in the States. I have
limited my written remarks to be cognizant of my allotted
time, but NCSL has put together a very detailed database of
State Autonomous Vehicle legislation that contains all
introduced and all enacted legislation to date that is
available at ncsl.org.

Currently -- it was advancing without me.
Apologies for that. Let's see if it stays. Currently, 11
States and the District of Columbia have passed some type
of legislation related to autonomous vehicles -- apologies
-- and executive orders have been issued by the Governors
of Arizona and Massachusetts. But those numbers don't
accurately represent the State activity. It does not give
a full picture of everything going on across the country.
There is a lot more activity, as you can see.
Companies are testing autonomous vehicles across the U.S., including in States where the Legislature has not passed laws. Nevada, Nevada passed its first legislation in 2013, which mandates that companies submit a permit application, a $5 million bond, and proof that their self-driving vehicles have completed 10,000 miles of testing before vehicles can be allowed on public roads in the State.

During tests, vehicles must be supervised by people sitting in the driver's seat and passenger seats. Approved vehicles are given a red license plate to show that they are autonomous. Otto, a subsidiary of Uber, last year conducted a media event and demonstration of a truck driving on Interstate 80 that did not have proper permitting and the driver was in the back of the cab. Nevada has no penalties for violators, but because of this incident, the Legislature is currently looking into this issue during the current legislative session.

The State has established an autonomous vehicle initiative between the Governor's Office of Economic Development, Nevada Department of Transportation, the Department of Motor Vehicles, and the University of Nevada Las Vegas.

California passed A.V. legislation in 2012. The California Department of Motor Vehicles then issued draft
regulations in 2015 that would have required a licensed
driver behind the wheel at all times in the autonomous
vehicle. These draft regulations received significant
backlash from the industry that argued the regulations were
onerous and created roadblocks to innovation. In October
of 2016, the DMV issued a revised draft of regulations that
stressed that these are not a formal rulemaking but rather
the next step in an iterative process in order to collect
feedback that will be used to inform a future rulemaking by
the DMV.

According to these draft rules, SAE Level 3
vehicles would still require the constant presence of a
human driver to potentially take control of the vehicle if
needed. But vehicles meeting criteria for levels 4 and 5
will, in the future, operate driverless. Also in 2016, the
California Legislature passed a bill authorizing the Contra
Costa Transportation Authority, or CCTA, to test the first
fully autonomous vehicle not equipped with a steering
wheel, brake pedal, accelerator, or operator on a
California public road. This was necessary because there
had been testing with autonomous shuttles on private roads,
but they wanted to expand where the shuttle could go. The
California DMV also recently issued a new set of draft
rules in response to this legislation and they remain open
for public comments through the end of April.
Michigan enacted a series of bills related to autonomous vehicles. The bills would ease testing restrictions for testing to take place without the presence of a researcher inside an autonomous test vehicle, although said researcher would have to promptly take control of the vehicle's movements if necessary or the vehicle would have to be able to stop or slow on its own.

Additionally, autonomous vehicles are allowed to be driven on public roads in the State when they become available to the public. The package of bills also allows for truck platooning, which is commercial trucks traveling closely together at electronically coordinated speeds. However, there were some concerns by technology companies that the legislation includes limits to the types of testing such companies can engage in as compared to original equipment manufacturers.

Finally, one quick note on Tennessee, in 2015, the Legislature prohibited local governments from banning the use of autonomous vehicles.

With regard to State action from the executive branch, Arizona's Governor Doug Ducey signed an executive order in 2015 directing various agencies to "undertake any necessary steps to support the testing and operation of self-driving vehicles on public roads in Arizona." He also ordered the enabling of pilot programs at selected
universities and developed rules to be followed by the programs. The order established a Self-Driving Vehicle Oversight Committee within the Governor's office, and that committee met for the first time in August of 2016.

Additionally, Massachusetts Governor Charlie Baker signed an executive order in October 2016, "to promote the testing and deployment of highly automated driving technologies." The order created a working group on HAVs. The group is expected to work with experts on vehicle safety and automation, Members of the Legislature on proposed legislation, and support Memorandums of Understanding and other agreements that A.V. companies will enter with the State DOT, municipalities, and other State agencies.

The Mayor of Boston also announced his own executive order that same day that established the Boston Transportation Commission that would lead oversight of autonomous vehicles in the City of Boston.

In total, 20 States considered autonomous vehicle legislation in 2016. Thus far in 2017, 28 States have introduced 75 bills. This increased activity was anticipated due to the release of Federal guidance last fall.

On September 20, 2016, the National Highway Traffic Safety Administration released the first iteration
of its Federal Automated Vehicles Policy, or FAVP. Although this version stresses that the policy is an iterative document, with the change in administration, it remains unclear whether the document will be updated annually. Overall, there are four sections of the document, although I'm only going to touch on Section 2 in my comments, but of course I will be happy to discuss the others if necessary.

Starting with Section 2, entitled Model State Policy, or MSP, the guidance presents a roadmap for States to voluntarily use when determining how A.V. testing and possible deployment should be structured in their State. Although nonbinding, NHTSA's goal was to provide a framework for States to use so that while there may be minor specific differences between States in their testing and deployment requirements, overall structures would be similar. However, I would be remiss if I did not reiterate that this Model State Policy in no way binds a State from implementing an A.V. testing and possible deployment system that best fits its particular needs.

The other part of this section that you should be aware of is its discussion on the delineation of Federal versus State authority when it comes to autonomous vehicles. The document describes how the Federal Government is responsible for setting motor vehicle safety
standards, and therefore, States are currently preempted
from issuing any safety standard that regulates performance
if that standard is not identical to an existing Federal
Motor Vehicle Safety Standard regulating the same aspect of
performance.

However, States remain the lead regulator when it
comes to vehicle use. This incorporates licensing,
registration, traffic, law enforcement, safety inspections,
insurance and liability just to name a few areas. Further,
the document calls on States to consider updating possible
gaps in their own regulations that pertain to these areas
in order to make the transition from human-driven motor
vehicles to fully automated vehicles.

I'd like to close by quickly touching on how NCSL
has addressed the issue of A.V.'s. As one of the primary
objectives of NCSL is member education, we have over the
past year held a number of events looking into different
aspects of A.V. technology and how States are addressing
the many questions in front of them. And we will continue
to make sure that we serve not only as a resource for State
legislators and staff but also provide opportunities for
them to connect with other States to discuss and learn
about this new and exciting technology.

Again, thank you very much for the opportunity to
speak with you today, and I'd be happy to answer any
SENATE MAJORITY CHAIRMAN RAFFERTY: Thanks, Ben. Real quick question for you. Have any of the States put into law that any of the manufacturers of these cars would contribute to a fund that would educate law enforcement community to this and the first responders and to update statutes within the Legislature to handle these autonomous vehicles.

MR. HUSCH: I don't believe so off the top of my head, but that issue is one that has been discussed at NCSL events, as well as I've participated with other organizations. Specifically, there's an association, the American Association of Motor Vehicle Administrators, which is the DMV national association. And that is one that they are very focused on. I think to the point, how the public's acceptance and their knowledge of how these vehicles operate is a very important question, one that we not necessary have seen specific legislation on, but the issue is one that is on many people's minds.

SENATE MAJORITY CHAIRMAN RAFFERTY: Yes, State budgets are getting leaner and leaner. It's something we have to look to. Thank you.

Chairman Taylor.

HOUSE MAJORITY CHAIRMAN TAYLOR: Ben, our staff, in conjunction with some of the statistics you've provided,
I don't know if you saw this chart that has all the really variables of legislation throughout the country, and it looks like Senate Bill 427 checks off almost every box. I mean, have you got a chance to look at 427 and compared to other States to give us a sense of the comprehensiveness of that bill?

MR. HUSCH: That's a great question, and staff did provide me with this beforehand. And yes, I would agree that, you know, in going through 427, not only did I find that it touched on all of the items listed here, but I also went through it just for my own personal understanding of how Senate Bill 427 touched on the different areas of Section 2, the Model State Policy, and there are a number of areas suggested by NHTSA's guidance that are addressed in the legislation much more so than I have found with other States.

HOUSE MAJORITY CHAIRMAN TAYLOR: And is there anything that was particularly lacking that you saw?

MR. HUSCH: Not to my knowledge. I would say that for a first step -- and the bill is a good first step, but also what I think is important and is in Section 2 of the Model State Policy is Senate Bill 427 establishes an advisory committee that brings in many other aspects of State Government, not only the Legislature but different agencies of the executive branch to review different rules
and regulations so that in the future, as this technology becomes more developed, as, you know, level, say, 3 and 4 and potentially level 5 become available that the State can go back and, you know, look at past legislation and current rules and see what needs to be updated.

HOUSE MAJORITY CHAIRMAN TAYLOR: Thank you.
Thank you, Chairman.

SENATE MAJORITY CHAIRMAN RAFFERTY: Thank you, Representative Taylor.

Senator Scavello.

SENATOR SCAVELLO: Thank you, Mr. Chairman.

Good morning.

MR. HUSCH: Good morning.

SENATOR SCAVELLO: How many of the States that you have here that have passed legislation, what is the most amount of vehicles that are on the road in some of those States?

MR. HUSCH: I don't know if I have that information off the top of my head. I can definitely look and get back to you. If I had to take an educated guess, I would probably say California or Nevada.

SENATOR SCAVELLO: And any idea of how many --

MR. HUSCH: Off the top of my head, I'm sorry.

SENATOR SCAVELLO: So it's still that early then as far as some of these States that have moved forward
with --

MR. HUSCH: Yes, and I --

SENATOR SCAVELLO: -- legislation?

MR. HUSCH: I think one point that I might make is Tesla's current vehicles that are for sale, some would consider their autopilot to be level 2. So, you know, I don't have the knowledge of kind of what State has bought the most Teslas. If I, again, had to fathom a guess, I would say California. So, you know, I think from that I would say California, but I can look into this and get back to you.

SENATOR SCAVELLO: All the car manufacturers are looking at this or is it just one or two companies?

MR. HUSCH: I would say it's being looked at by a number of car manufacturers. And not only car manufacturers but also technology companies from Uber and Lyft and those that I'm probably not even aware of and those that have not even formed yet.

SENATOR SCAVELLO: I look at this in the future to address the drunk driving problem, you know, honestly. If this gets perfected, those type of accidents go away.

MR. HUSCH: I think the safety benefits are immeasurable.

SENATOR SCAVELLO: Yes, safety benefits -- thank you very much. Thank you for your time.
SENATE MAJORITY CHAIRMAN RAFFERTY: Thank you, Senator.

Representative Matzie.

REPRESENTATIVE MATZIE: Thank you, Senator. And thank you, Ben, for your testimony.

You mentioned in your testimony about the Federal automated vehicles policy and that with the change in administration it remains unclear whether the document will be updated. Has there been any indication for Washington at all where they are on highly automated vehicles from a policy perspective.

MR. HUSCH: I mean, I would say the FAVP, the first iteration was a great indication of where they are. You know, the career staff that were primarily responsible for writing the document are still in place, but in terms of certain political appointees, Secretary Chao has been confirmed, but I don't believe there are any other political appointments that have been made. So just in terms of the time that it takes for those appointments to be made and confirmed by the Senate, that may push the timeline back. But I don't have any personal knowledge of that. That is just something as my own personal opinion.

REPRESENTATIVE MATZIE: Sure. Okay. Thank you, Ben, for your work at NCSL.

Thank you, Mr. Chairman.
SENATE MAJORITY CHAIRMAN RAFFERTY: Thank you, Representative.

Senator Vulakovich.

SENATOR VULAKOVICH: Thank you, Mr. Chairman.

When we put the piece of legislation together, we wanted to bring everybody to the table and try to come up with the best at least initial piece of legislation that we could, but you always have to keep your eyes open and keep your ears in tune because there's always someone out there that can think of something that we did not think of even when you have the best people around the table. So we want to know that everybody -- to let you know that that's out there on both sides, whether it's in the House or the Senate. We'll work together on this issue.

It's new. You know, at one time I guess when we had planes flying in the air, we were worried about liability, well, what happens if that plane crashes and down in a neighborhood or something like that? So we're always going to have these types of issues, but, you know, I stressed during the whole time in the legislation about public safety. So, you know, I'm wondering. I question my own piece of legislation. I know we've got to worry about Title 75 enforcement. Is there something we have to change in certain of our Title 35 pieces in there that have to reflect this new technology? The driver, the operator, who
owns the car, who's in control of the car, all these things that need to be thought of.

And then liability issues, so if something does happen, okay, because, you know, in a report from the National Highway Traffic Safety, in their first step they released their policy in '16, like you stated, but they say trust is required between the public and entities looking to test and deploy the automatic vehicles. So trust is very important as a liability issue.

And so we need to think about the liability issues, too. I don't want some person who's a victim to worry about who they're going to go to or someone sits around a table, all the players on that side, the testing and deploying and everything else and the research, and everybody looks at one another and says, well, it's not my fault, well, it's not my fault. We'll let the victim handle it. So these are very important for that if you want trust among the public.

Now, I did notice that you talked about the Model State Policy, which in a way the other two parts of it, the current regulatory tools and the modern regulatory tools they refer to, they kind of come under I guess the Model State Policy, so that one I understand. But under vehicle performance guidance, they talk about a letter from the companies, the people doing all the innovation here, to the
National Highway Traffic Safety. Can you explain that a little bit because I'm not getting it because in the end it's voluntary, but they name that as their number one task and yet they say a lot to make it look transparent and everything else, but you didn't address it and I don't get the thing about the letters being voluntary.

MR. HUSCH: Sure. So just to make -- so the guidance was separated into four sections, and the first section deals with essentially a 15-point safety checklist that NHTSA recommends, nonbinding, that those entities be original equipment manufacturers, technology companies that those that want to test vehicles, that they essentially submit this application, and it has 15 different points. Now, it is nonbinding, and again, in Section 2, NHTSA suggests that States require this application be submitted in order for a tester to test an autonomous vehicle. Now, again, that is just a recommendation that NHTSA is making to States. It is in no way binding.

But I think in off-the-record conversations with NHTSA staff, I think they get exactly the point that you were talking about which is, you know, the public's acceptance of this, and that if they don't believe it is safe, they will be much less likely to accept it in a shorter time frame. And given the potential safety benefits, as well as the immeasurable other economic
benefits, I think their belief was that to increase the
public's acceptance will bring those benefits more in the
short term.

SENATOR VULAKOVICH: Okay. Well, it's a
discussion we need to have. But we certainly don't want to
do anything to curtail the -- it's all about balance, and
that's what we're trying to achieve with the piece of
legislation. And even if it passes, we still have an open
mind to change it. I don't care if somebody said I screwed
something up or if Representative Marshall -- I'm sure he
feels the same way on his piece of legislation.

But in any case, I think it's important that we
continue to have this discussion to make this the best
piece we can pass at this time with flexibility to change
it. And I got to tell you, if we can save lives, as a
former cop who has seen everything, I have seen everything
and the most horrible things, when that one person that you
save is someone that you love means a lot.

So thank you, Mr. Chairman.

SENATE MAJORITY CHAIRMAN RAFFERTY: Thank you,
Senator.

Senator Brewster.

SENATOR BREWSTER: [inaudible].

MR. HUSCH: I would not say that they have made a
final determination in terms of who would be considered the
driver. In the guidance issued by NHTSA, they insinuated that a level 3 vehicle, the driver of the vehicle would be the driver, but on a level 4, a level 5 vehicle, the vehicle itself or the software operating the vehicle would be considered the driver. So I think we've seen a few States essentially put in place maybe a placeholder, a liability amount that a tester would have to cover. But in terms of essentially final insurance regulations, I think that we are some years away from that, but that is a very important question to consider going forward.

SENATOR BREWSTER: It would seem to me that if we're marketing a product that would eliminate a driver that the producer of the product should play a role in paying the premium, as opposed to the consumer who's relying on the technology to protect the people in the car. I mean, it would seem like a logical -- what other logical explanation would you have for a driverless car?

MR. HUSCH: I have no disagreement with that. My only comment would be that, as the previous witness commented on, that level 4 and level 5 vehicles remain a number of years away, especially from mass consumer market adoption. And level 3 vehicles do involve a driver, and so in terms of going from where we are now to level 5 vehicles, there is, you know, essentially a gray or middle ground that will come first.
SENATOR BREWSTER: Okay. Final question. Have you had any conversations with the insurance industry to get their feedback as to how premiums would go up or down? I'm assuming that the industry's claiming that the automobiles would be safer, and therefore, we can tell the consumers that, regardless of who would pay the insurance premium, that the premiums would go down.

MR. HUSCH: The first part of that, yes, we have had conversations with representatives of the insurance industry. At our winter meeting in Washington, D.C., the committee that I staff held a discussion with a number of panelists from the Federal Government, as well as a representative of State Farm, and he made a number of those points that you just made.

SENATOR BREWSTER: Okay. Thank you.

Thank you, Mr. Chairman.

SENATE MAJORITY CHAIRMAN RAFFERTY: Thank you, Senator.

Senator Bartolotta.

SENATOR BARTOLOTTA: Thank you, Mr. Chairman.

Thank you for your testimony. I just have a question. I was looking over the list of the other 11 States that are doing the testing. It looks to me that S.B. 427 is the only one that has a revision for cybersecurity. So have there been discussions in other
States with cybersecurity hacking, others' ability to by any chance override an HAV? And to that point as well, is there an option with, say, law enforcement that might potentially have the ability to override an HAV if there were a crime committed or even as much as a traffic stop?

MR. HUSCH: Sure. To the first point I would say that almost every State is having that discussion, but in terms of enacted legislation, I would agree with the chart at least that was produced here. I would say it is one of the most popular topics that members from all States come to NCSL about not only on autonomous vehicles but on my other aspects.

And with regards to the second point, I would hope that there is that capability, but I don't know if I have the technical background to respond to the ability for law enforcement to work with the equipment manufacturer or the software manufacturer to help override a potential attack.

SENATOR BARTOLOTTA: And the last question, as far as data collection, I mean, you can't Google anything anymore that isn't permanently imprinted on your history, and you start getting all of these advertisements for every other thing associated with it and nothing's private anymore. So I'm curious to know who's collecting and saving the data as to where every single trip that you
take, every stop you make, every bit of your driving habit, who's collecting that data?

MR. HUSCH: Again, I'm not sure if I'm the most qualified person to answer that. I will say that that issue of data sharing is addressed in Section 1 of the Federal Autonomous Vehicles policy. It is a suggestion by NHTSA to be included in the 15-point safety checklist to at least identify how that information could potentially be shared. I think the thought process there was the concerns that you highlighted and so to have essentially a plan on paper by, again, the original equipment manufacturer or the software manufacturer to state up front what it plans to do with the data that it is receiving from these tests.

SENATOR BARTOLOTTA: Okay. Thank you.

SENATE MAJORITY CHAIRMAN RAFFERTY: Thank you, Senate. We're five minutes over.

Senator Stefano for a final question. Thank you.

SENATOR STEFANO: Thank you, Mr. Chairman.

Thank you, Mr. Husch.

MR. HUSCH: Thank you.

SENATOR STEFANO: My question is very brief. Are any of the other States' legislation, are they measuring their economic impact of their regulations?

MR. HUSCH: Not to my knowledge, but I would, for my own curiosity, would like to double-check that and get
back to you.

SENATOR STEFANO: All right. Thank you.

SENATE MAJORITY CHAIRMAN RAFFERTY: Thank you, Senator. And I will amend my statement. Representative Kortz, I'm sorry, Representative, I didn't see your hand there. So you have a question. Anybody who looks like Wyatt Earp with that mustache [inaudible].

REPRESENTATIVE KORTZ: Thank you, Mr. Chairman.

Thank you, sir, for your testimony.

Very quickly, the States that have been testing these HAVs, have there been any crashes of these test vehicles, and has there been any fatalities?

MR. HUSCH: So with regards to testing and fatalities, not that I am aware of. I do know that there have been crashes from certain vehicles that have been -- or from some autonomous vehicles but not to my knowledge with regards to fatalities.

REPRESENTATIVE KORTZ: Okay. And of those crashes, have any of those been deemed to be the failure of the HAV or was it some other driver wrecking into them from another vehicle?

MR. HUSCH: From my limited knowledge on this, my belief is that in a majority of cases it has been the human driver at fault, but there have been a couple of very what I would call low-level accidents that were caused by an AV.
REPRESENTATIVE KORTZ: Okay.

MR. HUSCH: But the majority of the accidents have been caused by the human -- or the at-fault person would be the human driver.

REPRESENTATIVE KORTZ: Thank you.

Thank you, Mr. Chairman.

SENATE MAJORITY CHAIRMAN RAFFERTY: Certain, Representative. Thank you.

Thank you, Ben, for your testimony.

MR. HUSCH: Thank you.

SENATE MAJORITY CHAIRMAN RAFFERTY: We appreciate it very much.

Once again, I remind everybody that Uber and Carnegie Mellon have test vehicles outside the North Office Building until 1:00 p.m. today. Uber and Carnegie Mellon, we want to thank them. And seeing our friend Mike Steffen back there reminds me that Penn State University and their grad students in George Mason University each have tables set up outside the room. I believe you make a left and up the hallway there. Thank you, Michael.

So George Mason and Carnegie Mellon are very interested in this project and have information here with us today. So thank you very much.

Next will be State perspectives on HAV authorization and testing, bring up a panel here if we
could. Mr. Kurt Myers is Deputy Secretary for Driver & Vehicle Services. We see Kurt quite often. Nice to see you, Secretary. Mr. Jason Sharp, Esquire, Executive Deputy Chief Counsel, PennDOT, you're the guys that can answer all the legal questions here for us today, Jason. Mr. Mark Kopko, Manager of Advance Vehicle Technology, PennDOT; and Major Edward Hoke, Director of Patrol, Pennsylvania State Police. Nice to see you, Major.

Thank you very much, gentlemen. Make sure you hit the button so your green light goes on, and you have the floor. Thank you.

MR. MYERS: Thank you very much.

Major Hoke, would you like to go first or --

MAJOR HOKE: [inaudible].

MR. MYERS: Okay. Very good.

Well, first of all, thank you. On behalf of Secretary Richards, it's a pleasure to be here today, and we appreciate the opportunity to respond and comment about Senate Bill 427.

As you've noted, I have with me Jason Sharp and Mark Kopko. They are two of the individuals within PennDOT who I consider experts in the field of autonomous vehicles and have worked very diligently over a number of years as we've developed our positions related to the use of autonomous vehicles.
In addition to that, I also want to recognize Roger Cohen. Roger is the Director of Policy for PennDOT. He's in the audience today. He was my co-Chair as part of the Autonomous Vehicle Task Force that was formed by the Secretary last summer.

I've submitted written testimony and I'll let that stand for the record. I do want to highlight a few areas in reference to the status of what we in Pennsylvania are doing today in relationship to autonomous vehicles not only as PennDOT but as the Commonwealth.

And you've heard already that HAVs technology holds tremendous potential to improve the quality of life for the citizens of the Commonwealth and for that matter the world. And it really speaks to issues of mobility, safety, and beyond just those two items, certainly from the standpoint of the environment and the benefits to our environment moving forward.

On a personal note, as you know, we have a law in Pennsylvania that requires Driver & Vehicle Services to take away the licenses of those individuals that for medical reasons have been determined by their doctor not to be able to operate a motor vehicle safely. That responsibility lies with me, and under that, I really don't have many options. And when your constituents come to you, the options you can give them are ask a friend to help, ask
a family member to help, or to rely on mass transit. All of those take away that ability, that mobility that that individual used to have, and I really believe that it is a wonderful future with autonomous vehicles that we would be able to offer the opportunity for those individuals to gain control of their lives again and that mobility. To me, that's significant, it's important, and it's a part of what we're attempting to do here in the development and the encouragement of the development of autonomous vehicle technology.

In the environment areas, there's no question about the fact that the use of autonomous vehicles could have a dramatic impact on the environment. In particular, we fully expect that as time goes by, today, the average vehicle sits for 22 hours a day. It's utilized two hours. We fully expect that ownership of vehicles will multiply from the standpoint of individuals that own vehicles that we expect that the numbers will dramatically increase so that 10 people may own one vehicle, and in that case, that means as well that we may be able to significantly reduce the number of parking garages and things of that nature in our larger cities and turning that back to green space, just one example of the potential environmental benefits.

And of course safety, you've heard the numbers already. Although the numbers aren't finalized yet, 2016
looks as though we're going to have numbers over 40,000 fatalities in the United States. That's a significant increase from 2015. And those numbers continue to go up. And you've heard about the challenges related to the technology, in developing it. And there's no question about that. But the fact of the matter is is that 94 percent of all of the crashes that occur in the United States are attributable to human error. And so if we can reduce that dramatically through the use of autonomous vehicles, that will have a significant impact in reducing the number of fatalities.

But the challenges are there; there's no question about it. I've just talked about safety, I've talked about mobility, and the other part of this equation is the law. When a human being drives their vehicle down the road, those three factors are constantly going through their mind, mobility, they want to get someplace; safely, they want to do it safely; and they want to obey the law. But as we all know, when you're driving down the road and you find a delivery truck that's parked halfway into the lane that you're going down, you have to make a couple of decisions. One decision is I want to keep moving, but can I do it safely? And if I do it safely, I have to go around that vehicle, which means I need to cross that double yellow line. So those are decisions that you're making
that our expectations are going down the road, that
autonomous vehicles will need to be able to make that
decision as well.

Those are challenges, and I know that Raj talked
about it earlier, and it's one of those areas when we look
at the development of this technology, we know those
challenges are there, but we also know that in the long run
the opportunities that it brings far outweigh -- and the
benefits far outweigh those challenges. And we will, in my
belief, in a period of time, overcome those challenges.

And as was noted, Pennsylvania truly is a
recognized leader in the area of autonomous vehicles. We
developed a task force, as I noted earlier, that Mr. Cohen
and I chaired. The Secretary, Secretary Richards made the
determination that we needed to bring together stakeholders
from not only industry but also other State agencies, as
well as individuals associated with our institutions of
higher learning.

To that end, we put the committee together. I
want to personally thank the Chairs of both the House and
Senate Transportation Committee. Your Executive Directors
were directly involved in those meetings as we held them
through the summer and were an integral part of helping us
to develop proposed policies, understanding those proposed
policies will need to change as this law goes through the
process and once it's finalized. But we truly appreciate their efforts.

The task force met over the summer. We finalized policy document in November of this year. It was presented to the Secretary. We then held a webinar that was held in December where individuals were able to send us emails and ask us questions about the policies. And we received a pretty extensive response. What I will tell you that clearly some of those questions were really related to the uneasiness about automated vehicle technology and what it really means. And that's why I commend the Committees for coming together and holding this hearing. I think it's really important that we do everything we possibly can to ensure that we're educating individuals about the use of automated vehicles, how it works, and also that all of us collectively are clearly conscious and concerned about the safe operation of these vehicles. And at the forefront of our discussions is certainly safety and how it relates to the testing and ultimately the deployment of autonomous vehicles.

A couple of areas that I -- you know, just from the standpoint of Senate Bill 427, I just want to highlight some of the areas that we from a standpoint of PennDOT find very important and we want to stress as we move through this deliberative process with Senate Bill 427. We believe
very strongly that policy is the appropriate approach here, and the Senate bill obviously addresses that. And that is of extreme importance. As you've heard and as you've read, the fact of the matter is this technology is changing not on a yearly basis and frankly not even on a weekly basis but in some cases on a daily basis.

The regulatory process quite frankly, because of its nature, is not designed for a changing technology that we're dealing with here when it comes to autonomous vehicles. We need to remain flexible. We need to be able to change accordingly as the technology changes, so remaining flexible and nimble is critical. And in fact even in NHTSA's guidance, that was something that was recognized by NHTSA as well. And so I would encourage you as we move down the road with this legislation that we continue to focus on that flexibility and remaining nimble, understanding how the technology is changing. We don't want to unintentionally create barriers to testing and ultimately deployment, and so that flexibility is critical.

We believe that the HAV Safety Advisory Committee is also a critical component of the future as we develop automated vehicle technology here in Pennsylvania. It's a critical component, and we commend the legislation for that being included. It's critical that we bring together stakeholders on a continuous basis. You know, when we put
the policy together, Mr. Cohen and I had many conversations about the fact that this is a living document. This is just a good first draft if you will. We know it's going to change, and in fact, there are already things in it that we know will need to be updated as we move forward. So continuing to have those conversations will be a critical part of what we do moving forward, and the Committee is an important part of that.

One of the things though that I think we want to stress is that we do believe that the law should require HAVs to either have an operator or not be able to achieve a minimal-risk condition. It's an industry-accepted standard that requires a truly driverless car to achieve a safe mode to speak. And one of the things that I think is important that we heard here in discussions in references to the levels, level 1, 2, 3, 4, and 5, and one of the challenges, but one of the things that we need again to remain with the flexibility is how does someone make the determination as to the level of the vehicle? What is the level of the vehicle? What has it achieved? And at what point, regardless of what level that vehicle has achieved, at what point in time does that vehicle go from testing to deployment?

And so those are questions that remain, but I would encourage you from the standpoint of the legislation
to ensure that you maintain the flexibility in the legislation to allow for the natural evolution of the technology and the ability to be able not only to test these vehicles but ultimately to be able to deploy these vehicles on the streets of the Commonwealth.

There are a few items specific that I wanted to note just briefly here that we have some concerns about, and they are specifically in the legislation we do have some concerns as to the markings related to the vehicles in the legislation. Nevada was brought up in an earlier conversation. Nevada has a license plate which has created issues for vehicles when someone wants to go from California to Nevada. They literally have to stop and put the Nevada license plate on because it marks it as an autonomous vehicle. These are just cumbersome issues that quite frankly if we're going to encourage the development of this technology, these are the little things that I think are items that need to be addressed.

We're not suggesting for a second that the vehicles shouldn't be marked in some manner. We certainly respect the importance of law enforcement and first responders to be able to identify the vehicles. But at the same time we want to be sure that it's done in such a way that's reasonable for the manufacturers of the vehicles and the technology.
There is one item in here that is in reference to the requirements for registration and titling of HAVs and platooning vehicles, and we only note it because of the fact that existing titling and registration in Chapter 11 and 13 of the Vehicle Code apply to all vehicles, including HAVs, so making these provisions is a duplication of current law, and we just wanted to point that out. And that is pointed out in the detailed testimony.

In addition to that, there is in the legislation a reference to codes. We have concerns with that only because of the fact that because they're being called codes instead of brands, brands are something you're all familiar with. We brand vehicles today, whether they be flood vehicles, reconstructed vehicles, former taxis, recovered theft. All those vehicles are currently branded, and we don't have an issue with branding the vehicle as a HAV. We do have a concern with creating a new code if you will because there are systems costs that are associated with that. And here again, there's really no reason to do that when we already have the brand field available to us.

One of the other areas that I just want to stress and then I'll close and that is in relationship to platooning. Platooning is addressed for levels 3, 4, and 5 in the legislation, but platooning is not addressed for levels 1 and 2. And there are manufacturers of platooning
vehicles at level 1 and 2 that are interesting not only in testing but also deploying. I simply state that from the standpoint that it is something that will need to be addressed as we move forward, not necessarily in this bill, but it certainly should be addressed so that those individuals who are testing at level 1 and level 2 for platooning have the same opportunities as those who are testing at levels 3, 4, or 5.

With that, Senator, one other item and that was in reference to the $1 million fine. We were unclear about that from the standpoint that that's not something we've seen in other State legislation, and it does seem that the fine could potentially be excessive. But, again, we weren't sure what it was based on so we raised that as also just a potential concern.

So with that, I will close and at this point in time I will turn it over to Major Hoke.

MAJOR HOKE: Good morning, Chairmen, Committee Members. I appreciate the opportunity to appear here this morning and provide you the PSP perspective with regard to Senate Bill 427.

Ensuring highway safety is a core function of policing. The PSP and municipal police officers from all across the Commonwealth work hard every day enforcing traffic laws to prevent crashes and improve highway safety.
The duty to enforce the law is an obligation taken very seriously by all police officers.

Today's hearing on Senate Bill 427 to propose oversight of the emerging HAV industry is an important step forward to ensuring that the Commonwealth's law enforcement officers are provided with the statutory authority they need in order to keep our highways safe.

Currently, there are no laws that enable, prohibit, or regulate the testing of HAVs on Commonwealth highways. The absence of legislation creates an enforcement void that our existing statutes do not address. Establishing a legal framework is necessary for the safe and responsible testing of HAVs on our highways both now and into the future.

Recognizing that this rapidly evolving industry has an interest in testing their vehicles on Pennsylvania highways in real-world conditions, the Department of Transportation took the initiative to establish an Autonomous Vehicle Task Force. Last June, at the invitation of Secretary Leslie S. Richards, PSP joined with many other public and private stakeholders to formulate recommendations to develop policies which would regulate the testing of HAVs. The task force met monthly over the seven months and worked diligently toward the goal.

Although comprised of a variety of different stakeholders,
each with their own separate interests, the group never
lost sight that public safety was paramount and that that
had to remain the focal point of all of the policy
recommendations.

The task force completed its work in December
and, the recommendations were delivered to the Secretary's
desk. Although the initial recommendations have been
completed, the work of the task force will continue into
the future as the new and innovative technologies evolve.

We live in an interesting and exciting time in
history. While new and innovative technologies continue to
provide new opportunities that were difficult to
conceptualize just a few years ago, they also bring about
many new challenges. No matter what those challenges may
be, the Pennsylvania State Police remain committed to
protecting and serving the citizens and the visitors of
this Commonwealth just as they have since 1905.

Thank you for the opportunity to provide our
perspective, and I'm happy to answer any of your questions.

SENATE MAJORITY CHAIRMAN RAFFERTY: Thank you,
Major. Anyone else want to speak before we -- okay. Turn
it over to questions.

Senator Scavello.

SENATOR SCAVELLO: Good morning. Thank you for
your testimony.
Kurt, you're the most unpopular guy amongst seniors. You know what I'm talking about. And this really, I agree with you, totally, it gives them back their lives, that they'll be able to go anywhere they need to go with a vehicle. You know, this is that technology that we really need, and as well as, you know, I said it earlier to the earlier gentleman that testified, people with drinking problems now have a way of getting home without a problem.

I didn't think of 10 people using one vehicle like you mentioned, but I guess that is possible. The car can drop you off at work and goes back and picks up Mom and drops her off at work. It's amazing.

Major, how do you pull one over? Like, for example, you're behind that vehicle. How does the car pull over?

MAJOR HOKE: Well, sir, as I said, this technology presents many challenges. And the task force has addressed a number of those scenarios as we've completed our work.

But to your point and what the Deputy had mentioned here earlier, most of the autonomous vehicles interested in testing on Pennsylvania roadways at this point are level 3's, which require an operator seated behind the wheel of the vehicle with the assurance there that that individual will be properly attentive to what it
is he should be doing at the time that that vehicle is in
operation. And one of the scenarios of course that we
propose is how does an autonomous vehicle navigate its way
through a work zone, which is not your typical traffic
pattern if you will that a vehicle would encounter. Also
an emergency response area, a crash scene, the approach of
an emergency vehicle, a firetruck, an ambulance, you know,
law enforcement vehicle, all of those things would then
revert to the operation to be completed by that operator of
the vehicle.

SENATOR SCAVELLO: I think with the technology
today to have gone this far, I'm sure that they'll be able
to figure those things out in the future, and looking
forward to the final product, the 5's shall I say, the ones
that can do it all.

Are we going to charge them for a driver's
license? You're going to have to think about that because
you're going to lose a lot of revenue.

MR. MYERS: Senator, you know, that's certainly
an interesting question. And certainly when we talk about
some of the concerns of individuals, there's no question
about the fact that this technology is transformative. And
in being transformative, it can be disruptive. And so
people are questioning, well, how does this impact truck
drivers? How does this impact other people who depend upon
driving for a living? I would suggest that it is something
that we will see an evolution from the standpoint of job
responsibilities --

SENATOR SCAVELLO: Yes.

MR. MYERS: -- and so more people will go into
areas and fields such as logistics. I mean, certainly from
the standpoint we know that when we went from the horse-
and-buggy to vehicles, many of the individuals who were
blacksmiths taking care of the horses and the wagons moved
on to become mechanics, and today we call them technicians.
Why? Because they need to know more about computers
necessarily than they do a braking system per se. And in
the future, those same technicians will need to know the
inner workings of the laser systems, the camera systems,
and the GPS systems to ensure that that vehicle is
operating up to its full capacity.

SENATOR SCAVELLO: Just one last point, and we
touched on folks given back their lives. The young folks
that made mistakes when they were teenagers and continually
made mistakes and have a 25-year suspension, now they've
got kids that have trouble going to work. There's a lot of
them in this Commonwealth. And again, this also will help
them go back to work. There's a tremendous amount of them.
I get those calls all the time because they just compound
their -- you know, one ticket, don't take care of it, and
it just keeps compounding. And that will also make them mobile again.

Thank you very much for your testimony.

SENATE MAJORITY CHAIRMAN RAFFERTY: Thank you, Senator.

Representative Harper.

REPRESENTATIVE HARPER: I'm not sure who gets this question, but we'll give it to the Deputy Secretary first. And along the same lines, when we put drivers on the road, they get learner's permits first, then they get driver's licenses. Do you think that we should put in place a system where we test the vehicle to see that it does or doesn't do what it's supposed to do and what level it's supposed to be at and then give different permissions based on what the vehicle can do? Do we need learner's permits for these test vehicles?

MR. MYERS: I'm going to turn this question over to Mark and Jason because it's really something that we discussed in our task force discussions. So Jason or Mark?

MR. SHARP: I think I'll just start.

Representative, from a standpoint of licensing the system, that gets caught up in the Federal-versus-State question of who has the authority to regulate vehicle safety and operational systems, which is traditionally a Federal role, versus the licensing of a driver, which is a State role,
with a common understanding that once an automated driving system, that hardware and software combination that actually is doing the driving, what we call the dynamic driving test that you just tell it take me home and it drives home and it avoids pedestrians and it makes the turns, more of that is left to the Federal Government to the extent that the Feds have always been the one to say these are the safety systems and the hardware and mechanics of a vehicle.

REPRESENTATIVE HARPER: Right. But that's my point. The Federal Government is regulating the safety systems that have to be in the vehicle. I'm wondering should we test the vehicle to make sure it behaves as planned? And going back to Senator Bartolotta's comment, do we test to see if it's got the software so the police could stop it if it's, you know, commandeered by a tourist or hacked or something? Should we test the vehicles, the individual vehicles as opposed to letting the Federal Government say this class of vehicles is cool for this purpose?

MR. MYERS: Do you want to address the demonstration of the ODD?

MR. KOPKO: Sure. So as part of the task force recommendations, it lines up with NHTSA, and we recommended that any potential tester submits an ODD, an operational
domain design, basically where and when your vehicle can operate. Can it operate during nighttime hours, during inclement weather? And based off of this ODD submission, then it will determine where and when you can actually test. As a tester progresses through and they can advance to new levels in their ODD, they should inform the Department, and then we can evaluate from there. As part of the policy recommendations, we put a clause in there that the Department could request a demonstration. So they have to submit their self-assessment, but then on top of that we could potentially request a demonstration depending on how far they advance through their ODD.

REPRESENTATIVE HARPER: Okay. But that doesn't sound as if it's vehicle-specific to me. Is it?

MR. KOPKO: It's tester-specific.

REPRESENTATIVE HARPER: Right, so a class of vehicles gets tested. I'm wondering if you say that this class of vehicles is supposed to have the ability to stop on a dime and be overridden by, you know, safety or whatever and that vehicle's software doesn't work, we would not know that unless we tested the vehicle.

MR. KOPKO: It would be for that specific tester we could have that demonstration done through the policy recommendation. So it wouldn't necessarily be vehicle class. Each tester would have to submit what vehicles they
are actually testing, and if there's multiple vehicles, then you could actually potentially request multiple demonstrations.

REPRESENTATIVE HARPER: Thank you, Senator. Or do you have another --

MR. SHARP: I was just going to add one of the things that Deputy Secretary Myers mentioned, that minimal-risk condition, the concept behind it is essentially if there is some sort of fault with a particular vehicle that it's designed to essentially shut itself back to a safe mode. So if there was a software or hardware issue --

REPRESENTATIVE HARPER: Right.

MR. SHARP: -- that caused it to not operate, it essentially goes back into the safe setting and would shut itself down. That would be the safeguard against a particular --

REPRESENTATIVE HARPER: Vehicle on the road --

MR. SHARP: -- HAV not working properly.

REPRESENTATIVE HARPER: Thank you very much. Thank you, Senator.

SENATE MAJORITY CHAIRMAN RAFFERTY: Thank you, Representative.

Representative Kortz.

REPRESENTATIVE KORTZ: Thank you, Mr. Chairman. Thank you, gentlemen, for your testimony.
Deputy Secretary, in your opening remarks, you talked about mobility and how the future looks bright for those folks, elderly, or those with medical conditions who may not be able to drive on their own. So obviously, from that I assume you're going to allow people that don't have driver's license to operate these vehicles? Is that the long-term -- do you envision that?

MR. MYERS: For a level 5 vehicle.

REPRESENTATIVE KORTZ: Level 5, fully automated, correct.

MR. MYERS: Potentially. I envision a time -- and we've talked about this -- in the future where individuals that own antique and classic vehicles, you know, the 2025 model, will need a license to operate those vehicles, but individuals that are simply passengers in an autonomous level 5 vehicle that's in full deployment, there would be no need for them to have a driver's license as we envision it today. And, you know, a lot can change obviously, but it seems as though there would not be a need for someone to have a license at that point for a level 5 vehicle.

REPRESENTATIVE KORTZ: Okay. That being said, now as we get older, some of us lose some of our cognitive ability. I assume that, you know, there's certain people that still would not be able to drive because of dementia
or those type of reasons. So I assume there might be some
type of a driver's test down the road that you at least
have -- so you don't get in a vehicle and say, okay, take
me to Cincinnati. I mean, that could happen, correct?

MR. MYERS: It could, but I could also imagine
the technology being able to keep an individual within a
grid so that as a family member, you could set the vehicle
so that it could only travel within certain areas and
things of that nature. Again, the technology is such that
those are the types of things that the developers and
others, the other futurists looking at this will say here's
what we ought to develop into these vehicles because these
are potential concerns.

REPRESENTATIVE KORTZ: Yes. I hope the task
force is taking some of this into consideration as we go
down the road. And I know we're 10 years off or whatever,
but there's a multitude of things here, young drivers,
elderly drivers, that open up a whole other can of worms.

So thank you for your testimony.

SENATE MAJORITY CHAIRMAN RAFFERTY: Thank you,
Representative.

Senator Vulakovich.

SENATOR VULAKOVICH: Thank you, Mr. Chairman.

Okay. Mr. Myers, you brought up issues of
calls regarding marking some vehicles, specifically
license plates. So with regards to that, you travel across
state lines, you leave one state to another state, another
state who has no -- maybe they don't even have legislation
governing these types of vehicles. What gives that vehicle
the right to cross over state line into another state if
the federal government hasn't issued some type of -- I
don't know what the hell you call it, inter-commerce or
something? I have no idea. What gives them the right --
if you have the state police like in West Virginia and we
have one of these things and you drive over into West
Virginia, state police say, well, you don't have a
registration plate on here; you can't drive here?

MR. MYERS: Senator, I wasn't suggesting that
they wouldn't have a license plate. I was suggesting that
in Nevada it's a very specific license plate that has to be
on the vehicle so that if you bring a vehicle in from
California, as an example, they literally have to take the
California registration plate off and put on a Nevada
license plate that shows -- and I believe they use the
infinity sign for their license plate.

And so all I was suggesting there was that there
are ways -- we think the vehicle should be marked.
Obviously, from our standpoint the vehicles need to be
registered, they need to be titled, and as such, they would
have a Pennsylvania license plate on them. What we were
simply saying is that we think there should be some flexibility as to how that vehicle is marked in consultation with the State police, whether that's on the windshield or whether that's on the bumper or someplace. We're not suggesting it shouldn't be marked. We were just concerned about the fact that we were talking about putting, you know, very specific on the license plate. That may ultimately be the best solution. I'm not suggesting it's not. But we wanted some flexibility in the legislation to working with the State police make the determination as to whether the best location would be for the marking.

SENATOR VULAKOVICH: Okay. And then you brought up Chapter 11 and 13 of titling and registration. Are there changes that need to be made in there as is or would it need to be made to make accommodations for more lenience with the license plate?

MR. SHARP: One of the issues we looked at, Senator, in the legislation was the idea of the added provisions to specifically requiring titling and registration of HAVs in Pennsylvania led to the enforcement sections of the bill, which were directing PennDOT to pull registrations for certain violations. In addition to comments that are in our written testimony where we think that might be a bit beyond the need giving other penalties
within the bill, it seemed repetitive only because that
would only apply to Pennsylvania registered and titled HAVs
and really wouldn't extend to test vehicles that might be
brought in by a tester from another jurisdiction but would
meet all the Federal safety guidelines and Pennsylvania
State requirements. There would be nothing that would stop
them from testing in Pennsylvania. That would be a barrier
to testing that we didn't think was necessary. And no
changes are necessarily apparent from the face of an 11 and
13 right now.

SENATOR VULAKOVICH: Okay. You made reference to
codes versus branding.

MR. MYERS: Yes.

SENATOR VULAKOVICH: Major, this is all new. I
don't know, codes versus branding, that's a new one to me.
How do you see that or would you have to do some research
on it to --

MAJOR HOKE: Senator, if you wouldn't mind, let
me get back to your previous comment regarding the marking
of vehicles. From a law enforcement perspective and from a
first responder perspective, we do believe that that is an
important issue that needs to be addressed. Simply because
this is all new, the technology is new, you know, until it
becomes mainstream throughout the country, first responders
and police officers that are going to be encountering these
vehicles need to know some definitive way that that's what they're dealing with, whether it be, you know, in a crash situation or whatever circumstance.

I know there was some question earlier on today with regard to the cybersecurity aspect. I believe Senator Bartolotta brought that up. There is an obvious concern to law enforcement with this type of technology that it can be weaponized, that if the cybersecurity is not adequate enough to protect these vehicles from being hacked, that they can be misused in a criminal way. You know, it's not a far stretch to envision a terrorist hacking into one of these vehicles and weaponizing it for, you know, a criminal intent.

So we have had those discussions regarding the markings of the vehicles, and we are confident that -- actually, it was one of the recommendations that PSP had made to Nolan Ritchie to include perhaps some further revisions to the current draft.

SENATOR VULAKOVICH: Okay. And if I could have just one other question, Mr. Chairman?

SENATE MAJORITY CHAIRMAN RAFFERTY: Go ahead.

SENATOR VULAKOVICH: With regards to platooning where you say that's not addressed in level 1 and 2 but is addressed in 3, 4, 5, okay, it only makes sense that how do you get to 3, 4, 5 with testing a different type of vehicle
but it's not really covered under level 1 and 2? Now, it brings me to my point. You know, driving the turnpike all the time, driving the interstates, you have these large tractor-trailers, all different sizes, and then you have the piggybacks where they have two of them. Should there not be different levels -- having a car versus a tractor and trailer, they may work the same way, but they don't drive the same way. So with the levels 1, 2, 3, should we not have a different thought pattern about the levels for those larger vehicles, transport vehicles, commercial, tanker trucks, things like that?

MR. MYERS: I think we should from the standpoint that there are companies that are in existence today that are solely focused on level 1 and level 2 platooning and have no intentions of moving beyond that. And this legislation as it's currently written doesn't address that.

I'll have Jason speak to some of the more details in reference to the specifics of the law.

MR. SHARP: Senator, there are two main issues with the way -- the definition of platooning vehicle in the current version of 427 exists, it only applies because it's a highly automated vehicle to 3, 4, and 5. It would leave those currently level 1 and 2 platoon testing operations potentially in legal limbo because it would revert back to where we are today, which is the law doesn't say anything
positively or negatively about whether they can do it.

Additionally, I think we've made recommendations in our written testimony there needs to be addressed the problem of Section 3310 in the Vehicle Code specifically that deals with following too closely whereas the point of platoons is to get the trucks in proximity to achieve fuel savings. That would need to be addressed as well. But not addressing 1 or 2 either in this bill or in a separate piece of legislation leaves them in a legal limbo, and we just wanted to make sure that was pointed out.

SENATOR VULAKOVICH: Well, look, you're going to need to get together with the people from the House Transportation Committee and this Committee and our staffs. Look, this is new stuff, and there's a lot of us that don't have expertise in this area and it's new territory. So we're looking to the people who even agree it's new and innovative and we don't know where to go, but you're the best resource we have besides the people who are developing and doing the testing and the research and everything else.

So there comes a point in time we need to get together. We want to put out the best piece of legislation that we can before the Members who aren't as engaged in this as we are, and we are not as engaged knowledge-wise as all of you are. So there has to be a degree of trust in the public and amongst the own Members who want to put up a
vote for this thing and make sure that they're putting up
the best vote that they can put at the time and know full
well we'll be flexible on this as things change. So we
need to get together on this thing. I don't want to put
out a piece of legislation and tell them, well, everybody
said this is a pretty good piece of legislation but yet we
have some concerns about it. And when concerns come up, we
should address it right away, okay?

So just keep that in mind, and I think we need to
do those things. But, you know, we rely on the State
police for these types of things. They are truly the
expert and the Title 75 and then of course basically speak
for all law enforcement officers who have to enforce these
pieces of legislation dealing with Title 75 where something
happens with one of these vehicles and, well, I don't know
what to do with this. So there needs to be a lot of
discussion on this.

Major, you had something to say?

MAJOR HOKE: Senator, just to concur with your
point, if at any point in time if anybody would have asked
me in my lifetime if I would be sitting before a Committee
to talk about autonomous vehicles, I probably would have
laughed at them. But the reality of the situation is the
technology is here, it is now, and certainly from our
perspective, PSP's perspective, we're going to do
everything that we need to do to make sure that the
legislation that's drafted not only assures the public
safety but also gives the law enforcement community the
tools that they need to adequately address violations of
the law.

And I can tell you, and I'll give the recognition
where it's due here this morning if you'll allow me to
Nolan Ritchie from Senator Rafferty's staff. He's been
very receptive to our comments. He's been very good with
our dialogue exchange of information when we bring ideas to
him, to bring that to light in the legislation. So want to
recognize him for that this morning also.

SENATOR VULAKOVICH: Well, we can do this. We
got two Chairmen who are willing to work on this, and as
the Representative and myself, makers of the bill, we're
open to everything, but we need to have this ongoing
dialogue. And if something comes up, we need to get a
change and try to work out the best we can, okay?

Thank you, Mr. Chairman.

SENATE MAJORITY CHAIRMAN RAFFERTY: Thank you,
Senator.

And thank you, Major, for the kind words about
Nolan, appreciate it.

Representative Rothman.

REPRESENTATIVE ROTHMAN: So we had talked
earlier, and the technology is advancing rapidly. Sometimes government doesn't advance as rapidly. Are we prepared? I mean, the technology is prepared to have testing today, tomorrow. How far are we away as the Commonwealth in allowing testing to take place on our roads?

MR. MYERS: Well, as I noted in my earlier statements, Pennsylvania clearly is recognized as a leader not only nationally but internationally, and a great deal of that is based upon the fact that PennDOT took a leadership role a number of years ago with working with stakeholders, and really that leadership role goes back to the 2012 region, 2011 region when we were beginning our discussion about autonomous vehicles.

I'm proud to say that PennDOT, under the leadership of Secretary Richards, has a number of individuals that are directly involved at the national and international level related to automated vehicles in organizations such as AASHTO, TRB, as well as AAMVA. These organizations are very much in tune with what's going on not only in the U.S. and Canada but as well across the world.

And we have remained active with those groups because, as I think we all know and it's been said here earlier is that the more we think we know, the less we know
about this subject matter because it is changing so rapidly. And we're very fortunate that we have individuals that have that knowledge base and are learning within the Department but also in coordination, as I've noted, not only with the State police but also with other State agencies that we have brought in to discuss these matters so that we can all learn from each other.

So I think we're well positioned at this point in time. We understand, just as the bill represents, that having that committee, as I noted earlier, to carry forward and bring the stakeholders together will be a critical component to ensuring our future success as well.

REPRESENTATIVE ROTHMAN: And I just want to add thank you. And I didn't want my comment to -- you are well ahead of where I thought you were, so I'm very pleased and it's exciting. Thank you.

MR. MYERS: Thank you.

REPRESENTATIVE ROTHMAN: Thank you, Mr. Chairman.

SENATE MAJORITY CHAIRMAN RAFFERTY: Thank you, Representative.

Chairman Keller.

HOUSE DEMOCRATIC CHAIRMAN KELLER: Thank you, Mr. Chairman.

Major, we heard testimony that level 5 is about 10 years away. Now, I assume that all these cars will be
programmed to obey all the traffic laws in Pennsylvania. I was just wondering, has the State police looked at the loss of the traffic fines and the effect that will have on local municipalities, the State police, and eventually the Motor License Fund?

MAJOR HOKE: Sir, I think, as I mentioned in my opening comments, our primary mission or one of all law enforcement across the Commonwealth is highway safety. So the fines are secondary to the enforcement of the law if you will. So if the introduction of this technology accomplishes all those things that we're hearing from the manufacturers and the industry that it will, it will save lives. It will reduce crashes. It will, you know, provide the mobility that the Deputy spoke to earlier. But at the end of the day, people will be safer because of the technology.

HOUSE DEMOCRATIC CHAIRMAN KELLER: I completely agree with you, and that is one of the main things that will be accomplished by that. But another thing that may be accomplished -- and it always comes back to us around here -- is the loss of fines and how that's going to be replenished. I just wanted to know if the State police had any estimate because it's going to impact local municipalities also if the State police had taken a look at that. And, believe me, I'm for traffic safety and I'm for
saving lives, but eventually, we'll never get away from the revenue aspect of this, and I was just wondering if the State police had taken a look at that yet.

MAJ OR HOKE: We have not, sir. And I think at this point it would be a little bit premature for us to do that because simply we don't know -- we have estimates as to when this technology may become mainstream. However, they're only guesstimates if you will. So I mean, certainly, planning forward as this technology becomes introduced onto Pennsylvania roadways, we may be able to get some sort of an assessment down the road, but it's certainly something we'll be willing to keep an eye on for you.

HOUSE DEMOCRATIC CHAIRMAN KELLER: Thank you. Major, we do a lot of guesstimating around here so --

MAJOR HOKE: Yes, sir.

SENATE MAJ ORITY CHAIRMAN RAFFERTY: Gentlemen, thank you very much for your testimony today. I appreciate it. I know, Kurt, you're staying for the next panel as well.

Next will be the HAV testing roundtable discussion. Ms. Shari Shapiro, Senior Manager of Public Affairs for Pennsylvania and Delaware, Uber; Mr. Chan Lieu, Policy Advisor, Self-Driving Coalition for Safer Streets; Mr. Jeffery Perry, Director of Public Policy, General
Motors; Mr. Damon Shelby Porter, Director of State Government Affairs, Global Automakers; Mr. Wayne Weikel, Senior Director of State Government Affairs, Alliance of Automobile Manufacturers; Kurt Meyers, our Deputy Secretary will be here to answer any questions. He won't be testifying during this segment. I believe Mr. Lieu will begin the testimony.

Just so you know, please have a seat. Once again, hit the button. When the green light comes on, you can speak. A number of us will be leaving very shortly. We plan to be back. We have a Senate Judiciary Committee meeting we need to attend, myself included, and Senator Sabatina. Representative Taylor then will be taking over as Chair of the hearing. All the testimony will be recorded, so we'll make sure that we know what you're all testifying to here today.

So thank you very much. Mr. Lieu.

MS. SHAPIRO: We're actually going to change it up. I think I'm going to go first and then --

SENATE MAJORITY CHAIRMAN RAFFERTY: You're going to go first?

MS. SHAPIRO: Yes.

SENATE MAJORITY CHAIRMAN RAFFERTY: You change up the chair on me. No foul. No foul. That's fine. That's fine. Ms. Shapiro, it's always --
MS. SHAPIRO: I like to keep it fresh.

SENATE MAJORITY CHAIRMAN RAFFERTY: -- good to hear from you. Thank you.

MS. SHAPIRO: Good morning, Chairmen and the other Members of the Transportation Committees. Thank you for the invitation to testify this morning.

My name is Shari Shapiro, and I'm the head of the Public Affairs for Uber for Pennsylvania and Delaware. I'm here to take us back to Pennsylvania and to talk about a Pennsylvania success story that we can all be very proud of.

When fully deployed, the economic benefits of self-driving vehicles are expected to exceed $1 trillion in the United States alone. These savings are the result of reduced congestion and improved productivity, reduced commute times, fuel efficiencies, and of course to Chairman Keller's point, reduced health care costs. So we're going to see a shifting in the costs that are attributable to the vehicle sector. And for most of the world, this is going to take 5, 10, 15 years to be realized.

But that's not true here in Pennsylvania. Through the investment of companies like Uber, we are seeing the value of the investment in self-driving vehicles right now. Uber opened its Advanced Technology Center in Pittsburgh in 2015. Since then, we've invested hundreds of
millions of dollars in research and testing and deployment of vehicles with self-driving safety technology.

In less than two years, we've created over 500 jobs, both blue- and white-collar. We employ engineers, roboticists, artificial intelligence experts, as well as automotive technicians, vehicle operators -- I invite you to come and meet two of them outside with our vehicle today -- and maintenance staff.

Our expanding operations have also created a demand for goods and services from local small businesses. Let me give you an example. Common Plea, a catering company located in Pittsburgh's strip district, has served Pittsburghers since 1971. We hired Common Plea to provide the catering services to our Pittsburgh facilities. As a result, their sales have increased by 75 percent. They've hired 25 additional staff people. They needed newer trucks and kitchen equipment, which they bought locally. And their weekly orders with local businesses and farms have increased their productivity as well.

So by facilitating this kind of investment and bringing a new sector into Pennsylvania with automated vehicle technology, we have these great multiplier effects from the investments the companies themselves, which my fellow panelists will talk about, all the way through to our local businesses and farms.
In addition to Common Plea, we rely on several local high-tech electronic and mechanical components and vehicle manufacturers. We've redeveloped 55 acres of former industrial properties in Pittsburgh with the associated environment remediation. And we have ongoing work with six Pittsburgh architecture firms.

Most importantly, from our investment here, we showed that Pennsylvania is a great place to start or grow an autonomous vehicle business. In September 2016, we launched the first commercial deployment of autonomous vehicles on our road-sharing network. As a result, Pittsburgh was instantly rocketed to the top destinations for self-driving technology globally, and Pittsburgh's leadership was featured in headlines around the world. This is exactly the kind of reputation for technological advancement and innovation that we deserve to have in Pennsylvania.

There's now a burgeoning cluster of companies like Google, Argo, Aurora, and Delphi that are developing self-driving vehicle technology business in the greater Pittsburgh area. Students from local universities like Carnegie Mellon and the University of Pittsburgh that might once have left for New York or California now have the opportunity to stay after they graduate to become part of the technology revolution that is happening here.
Pittsburgh's growing self-driving vehicle technology cluster is a fantastic example of what can happen when State and local governments encourage innovation and take care to ensure that regulations do not create unnecessary barriers to growth. We've been able to test and deploy our vehicles in Pittsburgh without incident, without any particular requirements being in place, and without any incentives, tax or otherwise, from State Government.

Unfortunately, in its current form, we think that the language of Senate Bill 427 creates some upfront barriers to developing and deploying self-driving technology without making Pennsylvanians any safer in the ways that all of the panelists and Members have raised. It is our hope that we can work with the Committees to find regulatory frameworks that allow companies like Uber to continue to invest here while addressing some of the issues that have been raised.

We have the opportunity to foster the growth and innovation right here in Pennsylvania of technology and an industry that will generate jobs, spur economic growth, and save thousands of lives. We need to harness the opportunity to grow that industry here, and we look forward to working with the Members of the Committees to taking the legislation into its next iteration.
Thank you.

SENATE MAJORITY CHAIRMAN RAFFERTY: Mr. Lieu,
you're --

MR. LIEU: Thank you very much, sir.

SENATE MAJORITY CHAIRMAN RAFFERTY: -- going to continue.

MR. LIEU: Chairman Rafferty, Democratic Chairman Sabatina, Chairman Taylor, Minority Chairman Keller, and Members of the Senate and House Committees, on behalf of the Self-Driving Coalition for Safer Streets, my name is Chan Lieu, and I am pleased to provide this testimony for the Committees' joint hearing.

The Coalition was founded in April of last year by Ford, Waymo, Uber, Lyft, and the Volvo Car Group. We are focused on enabling the safe and swift deployment of fully autonomous vehicles. This cross-section of companies representing technology, automobile manufacturing, and transportation network companies demonstrates the widespread interest in developing this technology across different sectors. Despite their different backgrounds, these companies came together to form the Coalition because of their commitment to bring this tremendous potential safety benefits and mobility benefits of self-driving cars to consumers in the safest and swiftest manner possible.

The Coalition believes autonomous vehicles have a
great potential to make our roads safer and more accessible. As noted previously in other testimony, data from the National Safety Council estimates that 40,000 American lives were lost last year due to motor vehicle crashes. Since an estimated 94 percent of all crashes are the result of a human decision, whether driving drunk, as Senator Scavello had noted, distracted, fatigued, or at excess speeds, fully autonomous vehicles have the potential to dramatically reduce fatal crashes because they remove human error from the driving process entirely. In addition to these potential safety benefits, self-driving vehicles hold the promise of enhanced mobility for the disabled, the elderly, reducing congestion, and improving productivity.

Given the Coalition’s enthusiasm for autonomous vehicles -- more specifically, levels 4 and 5 -- our strongly held view is that self-driving vehicles have the potential to change the country for the better, and we support efforts at the State level to facilitate the rapid testing and deployment of fully autonomous vehicles. Likewise, we have concerns with legislation in any State that unduly limits and impedes the advancement and public use of this technology.

States will play a critical role in the deployment of fully autonomous vehicle technology, and the Coalition is encouraged that the legislators in
Pennsylvania recognize the significance. The fact that these two Committees are jointly holding a hearing on AV technology is encouraging and a step in the right direction.

The Coalition wholeheartedly supports Pennsylvania's interest in autonomous vehicles. At the same time, we are concerned that S.B. 427 would severely restrict the development and deployment of self-driving technology in the Commonwealth. The Coalition believes that this legislation is a well-intended effort to achieve our shared goals of improving safety and mobility but falls short for several fundamental reasons. As a result, we respectfully call upon the Legislature to shift its consideration of AV technology to explicitly include measures and steps that would facilitate greater testing and the rapid deployment of self-driving vehicle technology.

We are concerned that S.B. 427 would create substantial obstacles to the deployment of self-driving vehicle technology for several reasons. First, we believe the bill imposes regulatory hurdles for entities seeking to engage in testing. This is a significant departure from the National Highway Traffic Safety Administration's longstanding approach of encouraging innovation and development in new technologies while requiring manufacturers to self-certify that vehicles adhere to a
common set of Federal motor vehicle safety standards. NHTSA is the agency responsible for ensuring safety on American roadways and capably employs its broad enforcement authority and recall authority to ensure that companies do not introduce unreasonable risks to safety on our roadways.

A cumbersome preapproval process runs completely counter to the way this country has historically advanced automotive safety. From critical safety technologies such as seat belts, antilock brakes, airbags, to electronic stability control, we have a strong history of allowing the industry to innovate, develop, and deploy new safety technologies before rushing in to define and mandate what they are. The preapproval approach set forth by S.B. 427 would have the effect of stifling the development and rollout of AV technology and denying the safety and mobility benefits that this technology promises.

Second, the legislation focuses exclusively on the testing of AV technology, making no provisions for deployment. A testing-only approach is one that has been rejected by policymakers in other jurisdictions such as Arizona, Florida, and Michigan because AV technology is advancing at such a rapid pace. Further, they are preparing for its safe deployment and taking steps to be leaders in facilitating innovation. Coalition members are deeply concerned that proceeding with a testing-only
approach sends the signal that AV deployment is not welcome
in the Commonwealth. Moreover, such an approach would be
detrimental to the substantial investment that several
entities have made in Pennsylvania to date.

Because AV technology is so near to deployment, a
testing-only bill would likely be outdated the moment it
takes effect and another legislative effort would be
required to immediately clear the path for level 4 and
level 5 vehicles to be deployed. To the extent the
Legislature seeks to take action in areas of AV technology,
it should address both testing and deployment rather than
testing alone. More specifically, the State should examine
existing statute and regulations to determine if there are
present any obstacles to level 4 and level 5 deployment.

The Coalition appreciates the opportunity to
share our views on deployment of fully autonomous vehicles
in Pennsylvania. We are encouraged to learn that
alternative legislation to permit testing and deployment
may soon be circulated and are committed to working
collaboratively with all Members of both Committees towards
a reasonable policy that supports safety and innovation.

Thank you.

HOUSE MAJORITY CHAIRMAN TAYLOR: Mr. Perry?

MR. PERRY: Good afternoon, Chairman Taylor,
Chairman Keller. We've lost a couple others, Chairman
Rafferty and Chairman Sabatina. Members of the Committees, thank you very much for the opportunity to speak here today. My name is Jeff Perry. I'm the Director of Public Policy with General Motors.

And I would like to begin by pointing out that it has been an honor to serve on behalf of General Motors as a contributing member of the PennDOT Autonomous Vehicle Task Force. And we do greatly appreciate the opportunity to collaborate alongside with our fellow stakeholders, both public and private in that endeavor.

As you know, the task force was tasked with creating a framework in Pennsylvania to strike a balance between safety and innovation in this space while creating a clear pathway that elevates that State as a leader in the responsible development of self-driving cars. GM is a strong advocate for legislation that does just that, by paving the way for self-driving vehicles and vehicle testing and deployment here in the Commonwealth of Pennsylvania.

And while safety is General Motor's number one priority in this space, we do share many of the concerns that have been expressed by other panelists this morning, including many of those recently expressed by our peers here at Uber.

And given that many of my comments that are in my
testimony have already been stated, I'm going to save you a little bit of that time today and jump ahead a little bit. But as we've been discussing, with any new technology, there are certainly hurdles that we all need to overcome. Collaboration is definitely the key to getting over those hurdles and working together to resolve the uncertainties that we're all faced with. And they are certainly needed to realize the tremendous safety potential that this technology holds for all of us.

And it's important to remember that the development of self-driving cars provides many other potential societal and environmental benefits that have been discussed here this morning, not the least of which is providing transportation options to those that either can't afford the transportation or can't operate a vehicle or for some other reason have no access to personal or mass transportation.

At General Motors we are committed to a safe transition to self-driving cars, and we've focused on developing a suite of technologies that range from active safety features to fully autonomous vehicles. Our innovative technologies in our cars today provide many safety features, including full-range adaptive speed control, lane-keep assistance, forward collision warning, and collision mitigation braking to name a few. These
automated driving technologies represent the next logical step forward in the journey already underway to take transportation to this next stop as safe as possible.

But before we deploy those self-driving cars at the highest levels of self-driving automation, we need to capture and develop real-world experience in a safe environment, and we need to do it in a way that we can capture as much unpredictable, unscripted information and data to make this go as far as we can. There's only so far and so much that we can test with scripted information on planned roads and pathways, so I think part of what's missing in this legislation goes to the extent that this bill only addresses the authorization of testing and it misses an important step of deployment to the public where we're going to get access to that randomized information that comes from the unpredictability and the unscripted nature of that type of driving environment.

We do, however, believe that the existing legal barriers to the safe testing and deployment of autonomous vehicles need be removed. That was discussed a little bit earlier. For example, Pennsylvania's law currently requires a human driver to be in the vehicle at all times. This makes deployment of a self-driving vehicle, levels 4 and 5, significantly more difficult if not nearly impossible for a level 5 because in order to operate those
vehicles and know that they are doing what they're supposed to do, we need to be able to show they can operate without a human actually in the car.

But we do encourage Pennsylvania to join other States that have already acted to make possible for these cars to be tested and deployed in a driverless configuration, and several of those States were mentioned earlier today, including my home State of Michigan.

We believe that self-driving vehicle legislation should encourage and foster innovation, while also ensuring that safety is the top priority. And to that end, we are committed to working on an ongoing basis with the bill sponsors, the Members of these Committees, the PennDOT AV Task Force, our industry peers, and other stakeholders on legislative language that would improve the current provisions of Senate Bill 427.

HOUSE MAJORITY CHAIRMAN TAYLOR: Mr. Porter.

MR. PORTER: Thank you, Mr. Chairman, and Members of the Committee. In the interest of time, I know you've digested a lot of information and you have my official statement for the record that you can reflect upon in addition to the other testimony that you've heard today. I would like to just spend a few moments touching upon some of the comments that have been made by some of the other presenters to put into context really the public policy
questions that the Commonwealth of Pennsylvania should be discussing.

First of all, Global Automakers is a trade association. We represent the U.S. operations of international automotive manufacturers. We’ve invested over $56 billion in the United States, employ over 100,000 Americans, and in 2016 our member companies represented seven of the top 10 best-selling cars and light-duty trucks that were sold in the United States. So obviously our investment and commitment in the United States has been strong for many, many years and certainly has been very strong in the Commonwealth of Pennsylvania.

First of all, I really want to commend and congratulate the Commonwealth of Pennsylvania. You’ve demonstrated in a variety of ways your support for promoting autonomous vehicle technology. You really have been a leader in this space, and you should be commended for that. And you should also be commended for the great stakeholder that you have in government, particularly Kurt Myers, who we’ve had the pleasure of working with, as well as other folks that have been mentioned such as Nolan Ritchie.

I would like to point out just a couple of areas where you’ve been in the right way, you’ve done the right thing to promote autonomous vehicle technology. Number
one, in 2016, PennDOT wrote a letter to the Federal Communications Commission and urged them to preserve the 5.9 gigahertz spectrum, which we call the safety spectrum. Why is this important? The safety spectrum was allocated some 20 years ago to help automobile manufacturers and others deploy what's called dedicated short-range communication, or DSRC. This is something we really haven't touched upon today because we've been focusing primarily on autonomous vehicles, and autonomous vehicles has the ability through radar or lidar or cameras to have a 360-degree situational analysis of what's going on with that car.

But we really need to move beyond just the self-driving car to the ability of cars to speak to other cars, to talk to them, to talk to pedestrians, to talk to infrastructure. And this is going to alleviate a lot of the concerns that this Committee has raised such as how do we enforce traffic codes? How do we ensure when an ambulance needs to get down the road? How do we alleviate traffic congestion? A lot of this is with DSRC technology. We want to commend the Commonwealth of Pennsylvania for urging the FCC to preserve that spectrum.

Secondly, we wanted to commend the Commonwealth of Pennsylvania and particularly the City of Pittsburgh for collaborating with Carnegie Mellon and Uber to test
vehicles on public roads. This is very important in terms
of making both the public, consumers and other stakeholders
aware of autonomous vehicle technology.

Third, we want to congratulate the Commonwealth
of Pennsylvania and Pittsburgh again for being designated
by the U.S. Department of Transportation as a proving
ground. This is going to allow all of the stakeholders to
share best practices. Pittsburgh is only one of 10
communities in the entire United States to have this
designation.

And the fourth example that we want to commend
the Commonwealth of Pennsylvania is your significant public
investment, increasing $2.4 billion into transportation
infrastructure. A lot of that's going to go in terms of
helping autonomous vehicles and V2V communications
accelerate.

So the natural question that we really need to
have at this conversation at this informational hearing is
this: With all of the achievements that the Commonwealth
of Pennsylvania has made thus far and certainly there will
be more achievements that will be made in the future, is
this the appropriate time for Pennsylvania to be
introducing legislation such as Senate Bill 427 to foster
the right public policy environment for autonomous
vehicles? In the opinion of Global Automakers, we believe
that answer is quite frankly no. A lot of the conversation that you've had today has been to highlight other States and the legislation that has been passed, and that may give you the sense that perhaps the Commonwealth of Pennsylvania should follow that track.

We believe that there's an alternative public policy path that you can take, and it's not to follow the State of California, which has quite frankly imposed one of the most cumbersome, highly regulatory, dense, complex set of rules that will frustrate innovation. We believe there's an alternative path, and frankly, you're already working with that State, and that's the State of Ohio.

The Commonwealth of Pennsylvania, the State of Michigan, and the State of Ohio have worked jointly in what's called a Smart Belt Coalition to again figure out how we deploy autonomous vehicle technology not just within the borders of one State but how we work regionally. And this is very important I think for the Commonwealth of Pennsylvania to follow the path of Ohio.

The State of Ohio has not passed one law, they have not introduced one piece of regulation, and yet they have achieved many of the same successes that the Commonwealth of Pennsylvania's done. And I'll point to a couple of them. Number one, the City of Columbus was the first city in the United States to be selected as a smart
city challenge city. They were awarded $40 million by the U.S. Department of Transportation to become the first fully integrated transportation network to focus on automated and connected vehicle technology. They didn't pass one law; they did not implement one rule.

Secondly, Governor Kasich has designated a stretch of U.S. 33 as an innovation corridor, and he has committed over $45 million in additional resources to accelerate technology. Not one law was passed; not one rule was implemented. And as I mentioned before, Ohio has established the Smart Belt Coalition along with Pennsylvania and Michigan working across State borders to support research and develop additional technology.

While we understand that it is the natural progression for a lot of public policymakers to try to introduce legislation, we think that we should take a more incremental approach. We should try to find where there are impediments or barriers on your books currently that need to be removed so that more innovation will continue.

But if you're looking to introduce legislation because you want to show that you're open for business or that you want to try to attract or to retain those of us in the private sector or other stakeholders to come or to stay, or if you believe that there are important safety concerns that need to be addressed, we believe that through
collaboration, through cooperation by working with agencies such as DMV, Highway Patrol, and others, we can achieve these goals and a whole lot more.

But if you look at every other State that's passed a piece of legislation, they've had to come back time and time again to change that law because the laws will never catch up to the innovation. As was mentioned before, the technology is moving very rapidly. Does Pennsylvania want to be one of the States that's going to have to address this issue year after year trying to catch up with technology? Or does Pennsylvania want to be one of the States that is a leader by letting the technology and the information accelerate in its natural and organic progression.

So these are some of the comments that Global Automakers has. Again, I have mentioned we have an official statement for the record that explains much more thoroughly our position. We look forward to answering any questions that you may have. And again, we thank you very much for the time to be here at this forum.

MR. WEIKEL: Good morning, Members of the Committee. My name is Wayne Weikel. I'm here on behalf of the Alliance of Automobile Manufacturers. The Alliance is a trade association representing 12 of the world’s leading car manufacturers who, together, sell three out of four new
cars on the road each year.

While it is clear that the sponsors in this Committee and Committee staff, as well as Kurt and numerous people over at DOT have put a lot of effort into this legislation and this issue over the last few years, the end result in Senate Bill 427 is simply not something that the Alliance can support at this time.

We would, however, like to continue to work with the Committee and DOT on this issue, as we did last year. We provided numerous comments on the rounds of revisions of this bill last session. We also provided testimony to PennDOT in their working group. Regrettably, we continue to sort of see the same issues present in this bill.

The first challenge for any company considering testing is the complexity of this law outlined. While trying to solve for every issue raised, the bill gets mighty confusing. For example, the definition of a test operator is two full pages long. The sections on titling and registration and insurance all reference other Pennsylvania statutes. I've read the citations and I'm still not sure whether auto manufacturers are obligated or exempted from those sections.

And that's not to suggest that the complexity ends with Senate Bill 427. The bill also provides PennDOT cart blanche to develop layers of policy to implement this
law. That just is a lot for a manufacturer or a testing
compagny to come in and understand when they are looking at
venues to possibly test.

The definitions in this bill sort of combine SAE
definitions, NHTSA definitions, and then some definitions
that are Penn-specific. And when you're talking about
applying definitions to engineering specifications, minor
changes really do make a difference, and this bill has more
than minor changes in the definitions.

Kurt referenced the identification of how
vehicles are labeled when they're going down the road, test
vehicles. Testers will tell you that having an obvious
marking on a vehicle presents challenges. You'll either
have other drivers going down the road noticing that
sticker and then causing a distraction by hey, hey, that's
an autonomous vehicle, or you've got the people who have
are a little bit more nefarious who want to test the
technology and get in front of a vehicle and jam their
brakes on and things of that nature. As Jeff had said, the
goal of this is real-world testing. We want just a real-
world test, not a simulated or augmented sort of testing.

The confidentiality section in the bill we don't
think goes far enough. It only protects against
distribution to third parties, and from what our lawyers
have told us, the only way, the only way to keep sensitive
business information private is to share it as least possible.

Liability in this section we think does not go far enough. If our manufacturers produce a vehicle that rolls off the assembly line as a fully working vehicle and then another company takes one of our vehicles and changes the technology and somehow fails to do it correctly, we don't think we should carry any liability on that.

Platooning, it was mentioned a little bit earlier in some of the questioning, platooning is not automated vehicle technology. Platooning should be dealt with in a completely separate section of this bill or in a completely separate bill. In platooning, you still have a human being at the very front of the platoon making all the decisions. The trucks that are following are just tied electronically. Autonomous vehicles gather data from sensors and the computer is making decisions based on that data. It's advanced but it's not the same thing.

I think it's regrettable that the City of Pittsburgh was not able to participate today. They are the reason we're all here. The Mayor recognized the intellectual capital that that city had and welcomed industries to that city that could benefit from that capital. You know, as a result, everyone's aware of Uber's investment in that city. More recently, Ford announced a
billion-dollar investment, a billion-dollar investment in a
Pittsburgh-based technology company Argo AI, and Argo
immediately turned around and announced that they were
hiring 200 more employees.

In a story covering the Argo AI announcement, the
Pittsburgh Post-Gazette made the statement "The road to
self-driving future goes through Steel City." And they're
right. You know, just a few years ago, the development of
automated vehicle technology was seen as a race between
Silicon Valley and Motor City. The Mayor, through his
actions at presenting a welcoming alternate venue, he
changed that.

As Ben from NCSL had mentioned earlier, Arizona
is another State that has used the existence of a welcoming
regulatory structure to attract investment in autonomous
vehicle technology. Like the Mayor, Governor Ducey made it
clear that he wanted to help companies bring their
technologies to market. To do so, he signed an executive
order directing his administration to bring down any
barriers to testing. That is the sort of mindset that is
needed to remain a leader in this area. How can you bring
down barriers, not how can you put them up.

I heard a lot today about safety. Safety is
paramount, and we certainly don't question that. But I do
think the focus on that needs to be a little different.
The safety focus in this area should be on the 1,200 roadway deaths that the Commonwealth had in 2015 or the 1,195 it had the year before, or the 1,210 the year before that. Over the last 10 years, 13,256 of your constituents have died on the roadways of Pennsylvania. As you heard, 94 percent of those accidents were due to human error. Incidentally, the other 6 percent are 2 percent weather, 2 percent automotive vehicle, and 2 percent some miscellaneous.

You know, automakers have invested billions of dollars over the last decade to develop automated vehicle technology to reduce roadway deaths. The goal of policymakers should be to help automakers bring this technology to market as quickly as possible. It really isn't hyperbole to suggest that lives actually do hang in the balance.

In closing, while I would again like to express the Alliance and its members' commitment to work with the Committee and DOT, I would also like to recommend to Committee Members, as they're considering this legislation and others like it, that they consider two real simple questions when evaluating legislation: How is this needed to really promote safety in the Commonwealth? And what does this do to grow Pittsburgh's emerging AV industry. Thank you.
HOUSE MAJORITY CHAIRMAN TAYLOR: Well, thanks to all of you. It's a shame that we had conflicting meetings because now we're at the fun part, right? So even the audience now, everybody's kind of perked up. Now, we're at the stage where we all want to be where there's some conflict and just as a curious point, from the time Ms. Shapiro started till we got down to you, it just got increasingly more critical of the bill. So everybody had a little bit of license. Mr. Perry was very polite. Mr. Lieu not so -- and then bam.

However, you know -- and look, we have different roles, right, so I understand what, you know, Mr. Porter was saying. It's awesome from your end if there's no rules or no laws.

However, we did get testimony earlier about this 10-year span when level 5 would be maybe implemented, right? And I know there's not a lot of confidence in you that we could pass a testing legislation alone without going into implementation. You know, and I'm going to let Kurt talk because, you know, when I chair a lot of meetings, we love to have the conflict right there.

But when is that time? So when is the time when any of your companies would want to put that vehicle out on the street at level 5 and just -- and I understand. I mean, I'm sure that if we tried to do aviation, we didn't
want to hurt anybody, no plane would ever have taken off, right? So I get that. But if anybody has an opinion on what that timing is because I understand that you would rather see a bill that has testing and implementation all at once and be done. And we're constantly trying to catch up by the way in every industry in every Committee. We're never ahead of the curve the way we would like to be.

But I'd just like to hear when that is. When is that timing when you would just love to put that car out on the street? So do you want the most polite or the most critical?

MS. SHAPIRO: Well, I try and flip it around --

HOUSE MAJORITY CHAIRMAN TAYLOR: You go.

MS. SHAPIRO: -- keep it fresh.

HOUSE MAJORITY CHAIRMAN TAYLOR: Oh.

MS. SHAPIRO: So I would answer --

HOUSE MAJORITY CHAIRMAN TAYLOR: That's not a bad thing, Mr. Weikel. We'd rather get to the point, right?

MS. SHAPIRO: I would argue that there is no line, that this is iterative technology and that we will always be testing and that you could argue that we have already deployed the autonomous vehicle technology. It's arguably not even level 3, but there will never be a time when you can draw a line and say we've stopped testing, now we're going to deploy. For automobile manufacturers, you
may be able to say, well, this is the time that they started selling it to the public, but from fleet operators, from the FedExes of the world, et cetera, when is that line? I don't know. And that's the reason that a testing-only bill doesn't really make a lot of sense from our perspective.

HOUSE MAJORITY CHAIRMAN TAYLOR: Kurt, do you have any comments yet or would you like to see them respond to that? Okay.

MR. MYERS: I'll let these folks speak and I'll be happy to comment then.

MR. PORTER: Mr. Chairman, I think one -- and I think Shari's done a great job of answering one of the pieces of question. I don't think any of the members, certainly Global Automakers has ever suggested that the Commonwealth of Pennsylvania or any other State shouldn't consider introducing legislation and that there is an appropriate time for introduction of legislation. There is a critical role for States to play, there's no question, just as there's a critical role for the Federal Government to play in this whole public policy arena.

I think Shari touches on one very important part which is we've had automated technology in cars for 20, 25 years. This is not something new. And consumers frankly have embraced the automated features that have been
introduced in their cars year after year after year because
they're asking for more.

So to a certain extent what we need to be
thinking about is when you introduce legislation in this
State, how is it going to impact your neighboring States?
And I think this is probably the more critical question.
It's not so much what the legislation will do within the
boundaries of this State but what's the impact? So, for
everything, if the Commonwealth of Pennsylvania passes a
particular piece of legislation, what happens when that
autonomous vehicle crosses State lines? Is it still
certified or is it not certified? That's, you know, one
very important question.

Another question would be, you know, from the
perspective of an automobile manufacturer, we are designing
and building and selling cars that we hope will be
introduced in the marketplace of 50 States, not one, and so
we're very concerned whenever we're investing billions of
dollars in technology, will one State pass a law which will
in effect make that car only available to sell in one
State? And we have seen, this year, for example, 50 pieces
of legislation, and those 50 pieces of legislation, a
variety of different definitions, a variety of different
scenarios of when you can test, where you can test, how you
can test. And we can't as an industry of four to invest
that type of resources and time if we are not going to be able ultimately to deploy.

And the final piece I'll make, and I'll let my other colleagues speak, the importance of testing is really to determine what is the appropriate real-world application for a particular community. We don't know if the deployment of autonomous vehicles will take the form of platooning or commercial truck first, whether it will take the form of ride-sharing such as Uber, or you'll be able to go down to your local dealership and buy an autonomous vehicle. That's the importance of testing and that's the importance of collaboration. And I think those are the things that we need to focus on.

So it's not so much that we're opposed to any particular legislation for legislation's sake. It's the question of is it necessary to achieve the goals that you want to achieve?

MR. MYERS: Go ahead.

MR. LIEU: I definitely want to echo the comments of the other witnesses. The only thing I would add is, you know, if we take a page out of what the Federal Government is doing with the Federal Automated Vehicle Policy Guidance, I think NHTSA took a very, very, you know, wise approach in recognizing that we're still a ways away from developing regulations and standards. And so the mode that
they're in right now is data gathering, trying to learn as much as possible from the industry through things like that safety assessment letter, learning about what the manufacturers are defining for their own respective operating design domains. How are they developing cybersecurity technologies? What are these different components of what makes an autonomous vehicle an autonomous vehicle and how they intend to operate? And from there I think the regulators can have a better understanding of how to proceed, and I think that approach would be worthwhile to consider for the States as well.

HOUSE MAJORITY CHAIRMAN TAYLOR: [inaudible] Senator Scavello want to ask your questions now and then we'll have [inaudible].

SENATOR BREWSTER: Thank you, Mr. Chairman. It's just an observation, not a question. I was impressed by the way you sequentially talked about the kindness down to Mr. Weikel on the end, so mine should not be reviewed as being criticism but an observation.

Having heard the testimony, I just want to make a couple points clear. I think what you're doing is great, and I'm happy to be part of it, but there were some things said that aren't quite accurate and I just want to take you back a little bit.

We heard about Pittsburgh being a good partner.
I represent 38 communities. Pittsburgh's not one of them.
and I would remind everybody in this audience that where I
represent was the largest producer of steel in the world,
and everyone in this room has benefited from that 50 years
ago. And with all due respect to Pittsburgh, which is our
hub, no question, there are other areas, brownfield sites
that are just standing there waiting for you. And I
haven't heard from any of you. Two hundred and seventy
thousand people are waiting with open arms.

And, again, without any disrespect to Pittsburgh,
that's not the only game in town. These rivers are still
there. The brownfields are remediated. People are
displaced and unemployed, okay, skilled workers. So when
you do your strategic plan, I would suggest you go back and
revisit that.

Now, on the automation point, I'm a little old-
fashioned, and I've seen what we've done with education in
the last two years and we displaced 30,000 teachers. They
didn't all get jobs. So anyone that thinks when you
automate that there's a one-for-one replacement, that's
simply not true. I spent 30 years in the banking business,
and we dictated how people would bank and we put banks out
of business unfortunately.

So I would like to see your long-term strategic
plan, and I think any smart businessperson would say here's
who we're going to hire and here's who may get displaced.

It happens. How do we transform them and get them back into the industry, small things like where do we buy the steel for the automobiles and where do we get the technology, what country, you know, all the things that we hear on a national level now.

I believe in those things. You have an opportunity to reinvent communities across this Commonwealth, not just western Pennsylvania, third-class cities that have fallen deep into poverty. So to get my vote, and I want to do that, I want you to be mindful of those things because these are great opportunities that don't come around all that often.

I think Kurt went from horse-and-buggy to cars earlier on. I remember that. I wasn't sleeping two hours ago. And we're going to see big changes. We want to be at the beginning of that. But without saying any more and creating any more heartburn for anybody in the room or those that may not be here, we still have an obligation to 12-1/2 million people in the Commonwealth.

And I would just close by saying this: Some of us voted for Act 89, the transportation bill, freed up considerable money for roadways. And I'm hoping that we can somehow marry the technology that you present with the technology on the new roadways. I'm thinking there's
things you can put in the concrete to make sure older guys like me don't run off the road and all that good stuff. And this is a great time to think about those things. And I'm sure your IT folks are doing that as we speak.

But I just wanted to get that off my chest because it is exciting but right now it sounds like it's exciting for just a small region. And I would ask you to revisit that. We have a lot to offer in some of these other districts, not just my district but other districts throughout the Commonwealth.

So thank you, Mr. Chairman. If you want to comment, that's fine.

MALE SPEAKER: [inaudible] quickly, please.

MR. PERRY: Senator, if I could respond to that real quickly. And you commented that there are many folks across Pennsylvania other than in Pittsburgh that are sort of waiting with open arms for this technology to come to be a part of it, to be a part of that industry with us. And I think every one of us would actually agree with that, and that's sort of the scope and tenor of our comments here today is that what we're trying to say is that while we want to be able to come to Pennsylvania and we agree 1,000 percent that safety is the first and foremost priority, that what has been presented at this point unfortunately needs a lot of work. And the reason that there hasn't been
a lot of additional manufacturer activity in the State at this point is that we're not at that level yet that the manufacturers are feeling attracted to the State for that development.

SENATOR BREWSTER: Well, thank you. And thank you, Mr. Chairman. I would just again close by saying you've got McKeesport, Clairton, Duquesne, New Kensington, Lower Burrell, a whole bunch of communities that are sitting out there waiting. They deserve your attention. So thank you.

MR. PERRY: Yes, thank you.

HOUSE MAJORITY CHAIRMAN TAYLOR: I don't know what that was, but Kurt?

MR. MYERS: Thank you, Mr. Chair. I will be very, very brief. I just wanted to follow up with the comments that were made by the panel. And one of the things that I think is extremely important and I mentioned earlier was the need for flexibility in this legislation. It's critical, as well as collaboration, and you heard those words earlier brought up by the panel.

In addition to that, one of the most important things -- I had the opportunity to speak at the Royal Congress outside of Detroit in October, and I was asked by an audience, which was primarily automotive manufacturers, what's the most important thing that you can recommend as a
State Government in reference to the advancement of automation? And I said it was the word trust. There has to be a degree of trust.

And I would prefer that we not be called the regulators. And these individuals that are creating this automation, the manufacturers, we are partners and we need to move forward as partners. There needs to be that flexibility. I don't believe for a second and I know this panel doesn't believe that safety and innovation are mutually exclusive. The fact of the matter is is that they can go together.

And we understand that unquestionably the manufacturers, whether it be Uber or General Motors or any of the other corporations that are out there developing this technology are evolving at different paces. And it does create a difficulty if we only have testing to address when all of the manufacturers may not get to the point of deployment at the same time. And so then the question becomes do you say to a company A who's reached that point of being able to deploy, no, even though your technology is better, your engineers did a better job, you have to wait for the slowest one in the pack to get up to that point before we're going to pass legislation.

So I do believe -- and as the lead agency for the administration as PennDOT, that we believe that there has
to be that flexibility. There needs to be something to address that very issue because the message we are sending at that point in time, if we don't have that flexibility for some form of deployment process, whatever it might be, we're holding back those companies who have achieved the ability to be able to put a level 2, 3, 4, 5 vehicle out on the road.

I would also say, and I say this to the industry, with that trust and with that partnership also comes along the responsibility to ensure that that technology is ready to be deployed and is not simply a marketing ploy. That is critical because there will be nothing quicker to undermine the trust of the citizens of Pennsylvania and for that matter the citizens of this country than marketing decisions that override your ability from the standpoint of deploying that technology.

And so when we speak about trust, when we speak about collaborative efforts, it is critical that we treat each other in a way that allows for this innovation to move forward for all the benefits that have been discussed earlier.

Secretary Richards has a vision for the future that has an intricate role for the use of automated technology and how it will affect our society. I'd like to see that vision come true sooner rather than later, and I
think we can do it by working together.

HOUSE MAJORITY CHAIRMAN TAYLOR: I thought that
this segment, certainly Members appreciate it and our staff
and everything that you have said will be taken into
consideration I'm sure.

With that, John?

SENATE MAJORITY CHAIRMAN RAFFERTY: Thank you,
Chairman, and thank you for filling in. We've returned
from the Senate Judiciary Committee. Thank you, panelists,
for your time today, the Members. We have in the parlance
of baseball our closer for today. Representing the
Insurance Federation of Pennsylvania as President and CEO
Mr. Sam Marshall. Good to see you, Sam. And Sam's
testimony is one that's been of interest to a number of us
is what's going to happen insurance-wise with these type of
vehicles on the road, and we're happy to have him here
today to offer his testimony.

Thank you very much, Sam, and whenever you're
ready, just hit the button at the base and the green light
will come on and you can go.

MR. MARSHALL: Thank you, Senator. In my younger
more sensitive days I would have been a little hurt not to
have been a part of the other roundtable, and I would have
been a little hurt not to have been a part of a lot of the
stakeholder meetings that have been had because that's
exactly what the insurance industry is. We have a lot at stake here. We ensure the safety of people who drive on the public roads and we frankly -- I'd love to have a relationship with the regulator where we're partners. We don't enjoy that luxury. We don't get that ability because we are regulated. So should these entities.

I know sometimes we come along in this and we come across as sort of the Flintstones opining on the Jetsons and we seem to be the outdated ones, you know, trying to resist new technology and innovation. Nothing could be further from the truth. I think a lot of -- you know from our past influence on legislation we're huge promoters of driver safety, you know, sometimes not successfully, I mean, you know, things like the helmet law for motorcyclists, you know, things like speed limits. You know, sometimes we come before you and we make our case and you turn it down; sometimes, you know, we all go there. You know, we've done, you know, whether it's anti-texting laws, things like that, things to try to reduce human error, try to reduce accidents, and frankly try to take the cost out of the accidents and the injuries that come from it.

That frankly is why we're conflicted on self-driving cars. On the one hand we love the technology. We can't wait for it. We're eager. We see a lot of promise
in it to reduce accidents and reduce injuries. At the same
time we're concerned with the testing of it because what
you're talking about is testing experimental cars on public
roadways. It's what it is. You know, it sounds really
cool unless that test car is driving right next to you and
you wonder how those tests are going.

You know, from our perspective, you can have that
balance. You can do that balance. You can regulate that
balance. It's not going to be a partnership; it's going to
be a regulatory relationship, and it should be. But what
you can't do is let the promise of tomorrow overtake any
protection of the safety of today.

We've gone through the bill in considerable
detail, and you can see that from our attached comments
going through it section by section. You know, right now,
we don't think that it establishes the regulatory structure
that has adequate standards and the ongoing supervision of
the testing of these experimental cars on public roadways.
I'm not going to be able to go into every recommendation
we've made or every consideration that we've had, but I
will, in the interest of time and your own schedules, I'll
lay out our major concerns.

You know, first, insurance guy, the bill should
spell out the insurance requirements of HAV testers, you
know, highly automated vehicle testers and operators, and
their liability in the event of an accident. We hope there are no accidents, but these are test cars on public roads. You shouldn't have -- all of us are unwittingly going to be a part of that experiment. What are we going to do? We're not going to know that somebody's driving a test car right next to us.

If there is, God forbid, an accident, it ought to be clear for the consumer as to who's liable and where the consumer goes. You know, you don't want to say, gee, who was -- I mean, we talked about who the driver is at level 3 as if somehow the individual in the car who overrides the computer when the computer has a glitch doesn't work, that that's the real driver. No, he's not. He's the real corrector. He's the emergency responder. The driver was the computer. That's what got the car, you know, ran through the red light or did something wrong. But you don't want consumers who say, God, you know, where do I go? Who am I looking at? Everybody's going to point fingers the other way. Make it clear.

You know, second, the bill -- and you're going to have PennDOT processing applications. Make it clear what an applicant has to set forth to PennDOT and make it clear what the standards are for PennDOT, you know, to grant or deny or, you know, ask for more information on that application. It's not in there right now. The bill talks
about PennDOT collecting information. It's not what you
want. You want the applicant supplying information to
PennDOT saying here, I'm applying for this. Here's what
I'm submitting based on the standards that you've set
forth. I realize those standards are going to flexible.
PennDOT should have the ability to adjust its standards as
things evolve. But make it clear so that everybody knows
what it is. It shouldn't be PennDOT trying to collect it.
It should be the applicant submitting it.

Third, and related to that, the bill should clarify that when an applicant applies, say what level the applicant is applying for, and that's what the approval should be. You know, there was a lot of talk today about the differences between level 3, level 4, and level 5. And it may be that going into the future we'll have a level 3.2 or level 4.5. I mean, there will be flexibility. Make it clear what the applicant is applying for. You shouldn't be able to apply for a level 3 and then say, gee, whenever I feel I'm ready, I now get to be level 4. PennDOT should re-review each step along that way so that you have some level of public accountability on the safety.

Going to that, you know, talking about safety, the bill has to require an applicant to detail its cybersecurity procedures. And PennDOT should have standards for measuring the adequacy of those procedures.
You know, that's the heart of what we're talking about here. These are computer-driven cars. We all live in an era sadly of computer hacking, cyber breaches. There should be in any application a very clear outline of just what each applicant is doing to protect cybersecurity. You have a roadmap for that. You know, we as the insurance industry, the financial institutions as well, have just been put under a mammoth and correctly mammoth cybersecurity oversight. You know, it started out in New York as the home of a lot of the financial places.

But it requires you if you're an applicant to have a genuine cybersecurity plan, that you have real experts, they have contracts in place and you're doing an ongoing monitoring. I'm sure that all the applicants will be doing that, but PennDOT should know that. It should be on public record because, God forbid, if somebody cuts a corner here, somebody misses something somewhere and PennDOT says, you know what, we never thought to ask, you don't want that.

Also, along the lines of what PennDOT's role should be, require that an HAV tester immediately and regularly report to PennDOT about any cybersecurity breach, about any computer malfunction, and any instances of human intervention or override. That's the key to it. You know, frankly, if somebody's out testing a car on a public road
and it's had a bunch of computer glitches, PennDOT ought to know that and say, whoa, whoa, whoa, wait a minute. Let's ease up on the testing on public roads until you get some of those computer glitches cleared up.

It should know on an ongoing and real-time basis how many times when these cars are out being tested on public roads they need human intervention, human override. Gee, it went to the red light until the guy slammed on the brakes. You want to know that. PennDOT should know that. The public should have -- you know, I mean, if you're going to have testing of experimental cars on public roads, the public should know that those things are being looked at and it ought to be accountable.

And then finally, you know, I think you'd need any State law -- and there's been talk about this before. It's got to coordinate the role of PennDOT with that of the Federal agency, NHTSA as it's referred to. And then there wasn't a lot of mention, but there is in the details on this the Society of Automotive Engineers because they're the ones who are setting the levels 3, 4, and 5 standards. You need PennDOT -- you know, there shouldn't be three branches doing things in their own way or two branches doing things in their own way. They ought to be coordinated. Frankly, PennDOT shouldn't approve an applicant unless it knows that that applicant has also
satisfied NHTSA. You want the two agencies working
together. You want them coordinated in how they're going
to allow these cars to be tested on our roads.

You know, this has been an impressive group
you've had here today, but you haven't heard from NHTSA.
You haven't heard from the Society of Automotive Engineers.
It would be good to hear them come in and explain how they
want to work with PennDOT, how they're going to work with
every State agency that's doing this.

I appreciated the panel before, the roundtable.
Spiritually, I'm probably a part of that because I
understand onerous regulation. I even understand outdated
regulation. We come to you guys at times and we talk about
that. You know, I know that feeling. I don't think the
recommendations that I've made here today are onerous.
They certainly aren't in comparison with how we're
regulated on a day-in, day-out basis.

I mean, you know, the part where things -- if
you're going to experiment with something, that's great.
That's as it should be. We need Pennsylvania to be
innovative. I wish we had that same regulatory approach to
our industry at times, you know, but I understand. We want
this technology to be here. We appreciate, you know,
turning this into a techno center and all that. At the
same time, if you're going to test cars on public roads,
there ought to be some real live oversight on an ongoing basis from PennDOT because that's who's in charge of it. It'll coordinate with the State police, it'll coordinate with the local police.

You know, and there ought to be, if something goes wrong, clear liability rules. There ought to be an ability for PennDOT to say, hey, you know what, you got a problem here. I'm shutting you down temporarily until you fix it but until you're doing that. And I ought to know that on a regular basis. That's the way insurance companies are regulated. That's the way providers are regulated. That's the way most people who deal with public trust are regulated.

And since it should be here, I realize that in saying this I probably come across as a wet blanket and, you know, I'll accept that. I would say that last week, you know, there have been some questions about how quickly all of this is going to happen. And, you know, you go to these hearings and everybody -- you know, we're all very optimistic, you know, and I'm already starting to save for my car. We have some time and we have some time to do it right.

There was the Bosch Connected World conference last week, met in Germany. And the Bosch CEO, you know, I mean, they noted a couple of things that the State did what
you're dealing with far better than I might, you know, the Bosch CEO, and he's a huge fan of self-driving cars. He said, look, there a long ways off. It's not 10 years. It's significantly longer than that.

And as he said, of course, we still have to prove that an autonomous car does better in driving and has less accidents than a human being. We talked today about how these cars are going to eliminate human error and they're going to be very safe. That's the goal. That's the hope that I hope is the result, but we're not there yet. We don't have those results yet. And during the testing, you need to make sure that the testing is certainly no more dangerous than what you have now. You want to make sure that that testing is very thorough and accountable, not just, you know, sort of in-house secrets and all, boy, we better correct that.

You know, probably the more aggressive person at the conference when you read the reports was the NVIDIA CEO Jen Huang -- probably can't pronounce the name -- but he noticed something that when you think about it, it's very true in the world of driving. He said the whole key in this is going to be able to make computers be able to develop their own codes because, as he said, no human could write enough code to capture the vast diversity and complexity that we do so easily called driving.
I realize human beings make errors on the road. They also make judgments where you say, okay, I want to make sure the computer's able to make that same judgment. I want that computer, when it sees two blobs in front of it and one is Sam and one is a dog and it's got to go one way or the other, I mean, with all respect to the animal kingdom, I hope the computer doesn't hit me.

I mean, you need to make sure that that technology is perfected, you know, and that's incumbent on us as a State. It's not anti, you know, bringing in new industry. It's not anti, you know, bringing in jobs that, you know, have, you know, related benefits and all that. But it is to say that when you're testing experimental cars on public roads, make it accountable, make it verifiable, and make sure that you know what's going on.

And I would note, I mean, as much as reducing pain, I'll close with a parallel. When Uber and Lyft came in with transportation network companies, we were seen as the naysayer, we were seen as, you know, the roadblock and all that and we had hearings and all that. We actually listened and learned from each other. You know, it wasn't just educating and all that but everybody listened and learned and you pass a law that's a very effective law, that everybody agrees certainly with respect to insurance requirements and safety requirements and some clarity in it
with where people go with claims, that it's there, that there's accountability, and it works.

I think you can do the same thing here. I think it's got to be a genuine roundtable. It shouldn't be -- my roundtable is a pretty isolated one. I mean, it should probably be a more collusive approach, and we're happy to be a part of it. Thank you.

SENATE MAJORITY CHAIRMAN RAFFERTY: Thank you, Sam.

Questions for Mr. Marshall?

Senator Vulakovich.

SENATOR VULAKOVICH: You bring up a lot of good points with liability issues, and that's one of my concerns and I think it should be the concern of most of us. Liability is kind of like a little overseer to make sure that people do the right things, as is violations of law. You know, if you didn't have certain laws out there to guide you on the road, you see how people drive now, you can imagine how they'd drive if there was no rules of the road so to speak.

I'm not quite sure -- in liability issues we talk about -- it was in the other discussion that popped into my head here but, you know, there's violations of law. Right now, regulation may not be the way to go, and the best way to go is in this new innovative environment of this area to
go with policy. So I'm not sure how we determine and how we even have any oversight or penalties in regards to violations of law versus violations of regulation versus violation of policy. I'm not sure where we go there. I don't know how that will play into effect with the insurance industry. I don't know if these companies are going to go with a regular insurance company or whether they're going to insure themselves, so there is a lot of questions here.

But you brought up in the beginning of your testimony, Sam, about different things that PennDOT should do. Now, some people might say, well, that's out of the realm of concern of the insurance industry regarding what PennDOT does. Your job is to insure. How do you tie those together with your recommendations as far as the insurance industry saying that PennDOT should do some of these things in coordination with other people so that the liability issue that the insurance companies are concerned about is addressed?

MR. MARSHALL: As an insurance industry, our first concern is safety. That's what we want to know because, frankly, that's what we're insuring. We're insuring the lack of safety. And generally, we want to reduce that deficiency in safety as much as possible when we're saying, okay, here's what it is.
So if you're going to have a lot of cars being out tested, for instance, in the Pittsburgh area and a lot of talk about that today, that's great. What we'd like to know because we insure people who drive on the roadways in the Pittsburgh area, what we'd like to know is that those test cars are adequately regulated for safety concerns because if they're not, that creates a safety hazard and a safety exposure for us and our policyholders. So you need to avoid that.

And I know you have the whole focus here and frankly the promise of self-driving cars is that they will promote safety. And we as an insurance industry, we do a lot of things that may seem to be only indirectly related to what is the cost of insuring the risk, that's because we do a lot of things not just in auto insurance but across the board on safety measures. We'll always do that. It's part of our industry.

SENATOR VULAKOVICH: You know, I think how we can -- of course, listening to people and having the dialogue, but I keep thinking about, you know, when they do innovative things like high-speed trains and they're traveling on rail through certain areas and if you have railroad crossings and things like that, when they were coming up with all this innovation, especially over in Europe, you got some high-speed trains that are pretty --
well, in Japan I guess.

But with regards to public safety and liability issues, I don't know. Is there someone that has some reasonable commonsense approach because during innovative times you can't talk all the variables into account, but yet you still have to keep -- you know, it's nice to talk about public safety because that's my main concern because in government that's your number one concern, public safety. And I'm sure the industry, the insurance companies are all interested, but also business factor to you guys. If you don't have public safety in the foremost, it's much more likely you're going to pay a lot out on some insurance claim.

The companies want to -- as far as their business goes, there's a lot -- when people are in research, generally, they don't want a whole lot of restrictions on them because regulation can kill research, and we get that. But the research still has to be tempered with the idea that no matter what you do, you still have to think about people around you that may be affected during that type of research. There can't be so-called just casualties that might occur during a research time. We know that will happen, but somehow we have to try to regulate that. And it's like any type of innovative thing. We just don't know where to go with this as far as a liability issue goes.
You know, how do we protect victims so that they know where to go and what process to follow even down to the police officer who says, you know, like first thing we do is license, registration and insurance information. And we document that. And then the first thing you do is they call up your insurance agent and they talk to them. But if we don't have a process inside there to follow, I just don't know how we're going to address all that.

MR. MARSHALL: And that's a fair comment. And your difficulty here is that you're testing something that unlike, for instance, if you're testing a drug, the only person who might suffer from that is the person being tested and the person's been given that disclosure. Here where you're testing these cars, it's on public roadways. I mean, they're members of the public who had nothing to do with -- you know, they didn't sign off or accept the responsibility.

So what you do there generally, you're only regulating in this the automated test car. That should be the one liable. Now, whoever that applicant to PennDOT is should be the one who's liable, but that should hold true. What you don't want is -- let's say that's a car manufacturer and there's an accident. What you don't want is when that consumer says, okay, car manufacturer, I'm now suing you. And the car manufacturer said, no, you know
what, it really wasn't me. It was some software company
that isn't regulated here that isn't responsible to have
insurance. That's who did the software here, and that's
who you really ought to be going after.

You ought to have it whoever is the applicant to
PennDOT should be the one who is going to be responsible as
to the consumer. It may then have rights against other
parties. But it's much like, you know, when you register a
car, you have to have insurance on it. Now, if the car
malfunctions, it may have been because somebody put the
brake pads in incorrectly or something like that. Your
insurer may have an action later on against, you know, that
entity, but in the first instance, the car and its insurer
are going to be responsible. That clarifies liability, and
frankly, that makes everybody a little bit more attuned to
safety concerns as well.

SENATOR VULAKOVICH: In closing, Mr. Chairman, I
guess -- and I read some of the other things and we had
some discussions about this, but, you know, the collection
of data. We still have to protect -- because in research
people just don't want to freely give out their research to
someone else who hasn't put the money, the effort, and
everything in. They work on that research within
themselves, so we can't jeopardize the fact that they have
a certain privilege to certain information they have about
their research and hamper that and someone else takes
advantage of it. That's the way our world works. I mean,
you know --

MR. MARSHALL: And I would agree. I understand
the proprietary nature of some of these things. I don't
think that -- and nobody is saying here we want to see, you
know, what your secret recipe is or what the special sauce
is for that other entity, but I do think that PennDOT, if
it's going to be properly monitoring what are applicants to
operate test vehicles on public roads, PennDOT ought to
know, okay, have you had computer glitches. Because if you
have, we'd want to know about that because, you know, we
want to make sure that that's being corrected or we want to
shut you down.

We want to know how many times you've had to
override your computer, when you want to go from level 3 to
level 4 so that there's no longer a person in the car or
level 4 to level 5 where there's no longer a steering wheel
or brakes in the car. We want to know that, and we want to
know that you're ready for that. I don't think that
that's, you know, Macy's telling Gimbels just how it's
pricing things.

I think that that is a -- you know, that's not
saying here, everybody gets to look at how my computer
system is set up, but it is saying that the regulator and,
you know, the government agency that's in charge of safety
of our public roads knows that these test cars are
preforming sufficiently that it's not a real danger to
consumer safety. Those are just basic facts.

SENATOR VULAKOVICH: All right. Thank you,
Mr. Chairman.

SENATE MAJORITY CHAIRMAN RAFFERTY: Thank you,
Senator.

Sam, quick question. With the information given
to us this morning with seven or eight States, 11 States
having these cars now, within your federation is there
discussion as to this State's got a model program for
insurance on these type of vehicles or have you gotten that
far?

MR. MARSHALL: You know what, it's still evolving
on that, and even the map -- I mean, for instance, the map
had Pennsylvania painted blue as one of the States that has
an automated vehicle testing law, so I'm not sure frankly
how accurate that map is. But I know as an industry, you
know, we're trying to come to grips with it, too. I mean,
frankly, I don't think we've been fully at the table, you
know, with those who are making the cars and those who are
responsible for letting them apply. I mean, we get invited
to some meetings, not others and all that. We weren't a
part of PennDOT's task force. We are now. So I hope going
forward we'll be able to have more of a dialogue with the other stakeholders.

But I don't think right now, you know, we as an insurance industry can say, hey, this State got it right. This is the great model law. And some of that is because it may be great in terms of our concerns, but there might be other industries that have other concerns. They can be balanced. They can be reconciled. You know, what we're talking about is, look, if you're going to have test cars on public roads, make sure that the agency in charge of your State's public roads knows what's going on, knows who's out there.

SENATE MAJORITY CHAIRMAN RAFFERTY: Thank you. We'll --

MR. MARSHALL: I'm not sure what the objection is to that.

SENATE MAJORITY CHAIRMAN RAFFERTY: We'll make sure that the Insurance Federation has input going forward I think.

And we appreciate everyone today. I think Senator Vulakovich and Representative Marshall has gleaned some information going forward with the bills before they move out of Committee.

I want to thank the four Chairs for their support today and their questions, which I think elicited good
testimony, and all the Members of the Transportation Committee from both the Senate and the House.

Anything else for the good of the order?

If not, the first joint hearing of the Senate and House Transportation Committees for the 2017-2018 session will recess till the call of the Chair.

Thank you very much. Thank you, Sam. Thank you, one and all, for your patience.

(The hearing concluded at 12:30 p.m.)
I hereby certify that the foregoing proceedings are a true and accurate transcription produced from audio on the said proceedings and that this is a correct transcript of the same.

Christy Snyder

Transcriptionist

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