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Maryland, auto industry see promise, challenges of autonomous vehicles

By Ryan Marshall

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David Woessner, general manager of Local Motors, shows a car bumper that was milled in the largest 3-D printer in the country.

David Woessner, the general manager of Local Motors, in the company's National Harbor location.

Autonomous vehicles — known as “driverless cars” — are creating excitement and anxiety among officials who see their great potential but also understand the challenges they present for safety and regulations.

Many advocates of autonomous vehicles tout their potential for increasing safety.

There were 35,092 deaths on U.S. roadways in 2015, and 94 percent of crashes were caused by human error, according to the National Highway Traffic Safety Administration, or NHTSA.

Although autonomous vehicles exist in the real world, they're expected to become an even larger part of the market in coming years.

Tesla announced in October that all of its new vehicles will have the hardware necessary to be self-driving. Google posted on its website that it was conducting real-life testing in four locations and planned to have a fully autonomous car on the market soon.

Audi announced it would have an autonomous model on the market by 2020. BMW and Mercedes also are developing products.

The vehicles gather information from sensors about their surroundings, adjusting their speed, direction and other actions according to data they collect.

They also collect information from other vehicles, in a process known as vehicle-to-vehicle technology, using that data to inform their own actions.

Many newer vehicles already have elements of the technology that would ultimately allow fully autonomous vehicles, from parking assistance and lane-departure warnings to sensors that can automatically apply the brakes in an emergency.

The U.S. Department of Transportation and NHTSA acknowledged that autonomous vehicles, or AVs, soon will be an important part of how people get around.

“The rapid development of emerging automation technologies means that partially and fully automated vehicles are nearing the point at which widespread deployment is feasible,” the Transportation Department wrote in a 2016 update to its policy on the vehicles. “Essential to the safe deployment of such vehicles is a rigorous testing regime that provides sufficient data to determine safety performance and help policy makers at all levels make informed decisions about deployment.”

Maryland is positioning itself for the vehicles’ arrival.

The state established an autonomous vehicles working group with transportation officials, elected officials, representatives of state and local government, law enforcement, and the auto industry to establish policies and procedures for dealing with the new developments.

The group is trying to establish comprehensive rules to help guide the implementation of autonomous vehicles in Maryland, said Christine Nizer, administrator for the state’s Motor Vehicle Administration.

“We don’t want a patchwork of regulations,” Nizer said.

Part of the challenge facing the working group and others is trying to figure out how to regulate a field in which the technology is changing faster than anyone expected, Nizer said.

A bill filed in the Maryland General Assembly would allow Gov. Larry Hogan’s administration and Maryland State Police to adopt regulations governing inspection, registration, testing, and operation of autonomous and connected vehicles.

As of December 2016, nine states plus the District of Columbia have enacted laws related to autonomous vehicles.

One vendor has a car that doesn’t include a steering wheel, which means it currently wouldn’t pass state inspection, Nizer said, illustrating the need for wide discretion in the bill.

“There’s going to be a learning curve” as technology develops, she said.

But states should be careful not to stifle innovation with too much regulation as technology evolves, said Randal O’Toole, a senior fellow at the libertarian Cato Institute focusing on transportation issues.

States with no laws or fewer laws are better positioned to attract companies looking to experiment with new autonomous technology, O’Toole said.

Advocates of automation argue that having full vehicle-to-vehicle, or V2V, technology in as many vehicles as possible will let them “talk” to each other more completely and help computers make more informed decisions as they collect more data.

According to NHTSA, vehicles must be able to communicate a common set of data to one another, a concept known as “interoperability.”

“Without interoperability, manufacturers attempting to implement V2V will find that their vehicles are not necessarily able to communicate with other manufacturers’ vehicles and equipment, defeating the objective of the mandate and stifling the potential for innovation that the new information environment can create,” according to a NHTSA document advocating the new rule requiring V2V equipment in new vehicles.

The more vehicles with the technology, the more effective it will be, since “V2V can only begin to provide significant safety benefits when a significant fraction of vehicles compromising the fleet can transmit and receive the same information in an interoperable fashion,” the document said.

O’Toole opposes both V2V and V2I, or vehicle to infrastructure, mandates like the one proposed by NHTSA. In V2I, vehicles receive data and information from sensors embedded in roads or bridges, as well as traffic lights, buildings, and other structures.

He fears that requiring the technology in vehicles could have a detrimental effect by locking companies into technology that could quickly become obsolete.

But he also argues that smartphone applications or global-positioning satellite systems in cars already serve some of the uses of V2V technology by collecting information on road congestion and other problems and guiding drivers around them.

There can be a self-driving car without V2V technology by using sensors that detect obstacles and adjust their own actions accordingly, he argued.

In December, the state announced that it had applied to have a section of Interstate 95 between Havre de Grace and College Park selected as a future testing area for AVs.

That proposal was not chosen, although the U.S. Army Aberdeen Test Center was selected as one of the sites.

Maryland thinks it has a lot to offer as a testing ground for autonomous vehicles, Nizer said.

The administration will continue to look at any future testing opportunities because it believes Maryland is in a good position to take advantage of the new technology to save lives, Nizer wrote in an email Tuesday.

With areas such as the Aberdeen Proving Grounds, Fort Meade, the University of Maryland, Baltimore-Washington Thurgood Marshall International Airport, and the Port of Baltimore, the state can help show how the vehicles operate in different environments, Nizer said in an interview last month.

David Woessner, the general manager of Local Motors in National Harbor, agreed that Maryland and the Washington, D.C., area could make a great “living lab” for testing AVs, with its mix of university, federal and military campuses; diverse highway system; and urban and suburban

environments. Woessner's company develops electric vehicles that he hopes could be developed into autonomous vehicles.

The area between Baltimore and Richmond also has many corporate campuses that could supply environments for testing vehicles.

"I think there's just a tremendous amount of opportunity in this area," Woessner said.

While states will be responsible for registering autonomous vehicles and enforcing traffic laws and regulations, the need for vehicles to cross state lines has meant a vigorous role for the federal government in preparing for AVs.

The Obama administration and former Transportation Secretary Anthony Foxx were "pushing hard" to give guidance to states before leaving office, Woessner said.

In January, Foxx announced a 10-year plan to invest nearly \$4 billion to help speed up the development and adoption of autonomous vehicles by funding pilot projects.

The program was intended to fund tests of vehicle systems in corridors around the country and to work with the industry to develop a framework of states to support autonomous and connected vehicles.

The Department of Transportation is proposing a rules change that would require vehicle-to-vehicle communication in all new light-duty vehicles — vehicles that weigh 10,000 pounds or less — by 2020. The technology could help vehicles avoid crashes by letting them communicate with each other.

The technology sends and collects information about a vehicle's speed, direction, brake status, and other information to other vehicles around it.

The hope is that the information will help alert drivers to dangerous situations before they happen.

"This ability to communicate certain information that cannot be acquired by vehicle-resident onboard sensors makes [vehicle-to-vehicle] particularly good at preventing impending intersection crashes, such as when a vehicle is attempting to make a left turn from one road to another," a DOT summary of the proposed rule says.

The variety of development and regulatory issues that still need to be figured out means discussing automated vehicle issues "is premature at this point," Department of Transportation spokesman Jose Alberto Ucles wrote in an email.

The interconnectivity of V2V communication has concerned some privacy and safety advocates, who fear that vehicles' very need to collect information from each other makes them vulnerable to having that information stolen or even allowing hackers to gain control of the vehicles. Some have worried that their vehicles' information could make drivers vulnerable to surveillance by law enforcement or other government officials.

If every car has to be able to communicate with others around it, it would be easy to hack into the system to get that information, O'Toole said.

NHTSA suggests that V2V devices use a digital signature algorithm to make sure that the messages haven't been modified or changed en route.

Christopher Leinberger, chairman of the Center for Real Estate and Urban Analysis at George Washington University, said fears about data security are justified.

But he believes that tracking data from vehicles can be done with individuals' identities hidden.

The threat to data is, in part, one of the symptoms of living in the 21st century; people routinely put their personal information at risk, he said.

"People are so foolish in giving away their data anyway," Leinberger said.

In a May paper on policymaking and digital infrastructure, a team of experts from the Information Technology and Innovation Foundation warned about keeping privacy worries in perspective. They wrote that the government and private companies will have to work together to limit risks.

"Collaboration between the public and private sectors, such as through information sharing on cybersecurity risks and developing best practices, will be critical to predicting, identifying, mitigating, and recovering from cybersecurity intrusions and incidents that affect critical infrastructure," the paper said.

Woessner said it remains to be seen how much the Trump administration, including newly confirmed Transportation Secretary Elaine Chao, makes autonomous vehicle technology and regulation a priority.

Chao has a background as a deputy secretary in the Department of Transportation under President George W. Bush and knows that the technology is coming, Woessner said.

A Transportation Department spokesman did not respond to an email asking if Trump and Chao plan to largely continue Obama's and Foxx's policies on autonomous vehicles.

But Woessner believes that the government needs to make sure that the government gives states the ability to adapt to new technology.

"Putting a flexible framework together is critical," he said.