Highly Automated Vehicle Webinar – February 1, 2018

Follow-Up Questions and Answers

What will the expected role of the Commonwealth be in sharing data related to roadways and traffic with the producers and operators of HAV's?

The Department has already taken steps to share roadway information with 3rd parties by developing data portals. However, it is the belief of the Department that information coming from the Commonwealth should strictly supplement the operation of automated vehicles. It is infeasible to believe that safety critical systems should rely solely on external information from governmental agencies. For example, PennDOT believes that connected traffic signals will improve safety at intersections by broadcasting the signal phase and timing information. This information can be utilized by automated vehicles to navigate the intersection. However, if the equipment fails, the vehicle is expected to safely navigate the intersection by utilizing onboard sensors.

What plans are in place to retrain displaced professional drivers (both freight and transit)?

This is one of the most frequently voiced concerns that we hear. We do not believe that large-scale job displacement will occur soon, however, it is quite likely that the job demands and skills requirements for commercial drivers – both in freight and transit – will change dramatically over time. In the case of trucking, where there exists chronic driver shortages (which will only grow worse with a projected wave of retirements), increased automation may make the truckers' job safer, less stressful and more attractive. In transit, PennDOT and DCED are reaching out to transit agencies to encourage them to begin working with their workforce and unions to begin to envision how automated technologies will change their business and operations. We are also looking to establish collaborative efforts with unions to develop strategies to maximize the workforce development and growth opportunities of automation and minimize the disruptive impacts.

What privacy issues may arise and be handled by the Commonwealth for HAV's?

Access to the technology and the information flow as automated and connected vehicles interact with infrastructure and other vehicles could result in exposure of information and data. PennDOT has recommended that HAV testers and operators provide a self-certification specifying that processes and technologies are in place to address cybersecurity threats and should be aligned with cybersecurity best practices following national standards on risk assessment and management, threat detection and protection, and incident response and discovery, just to name a few areas.

Is PennDOT's role more to respond to what HAV technology enters the market or to shape the HAV technology and how it responds to our infrastructure? Or in other words what is our responsibility or role?

The introduction of advanced information technology into any sphere of life profoundly changes how things get done. This is no less the case for transportation. As vehicles with once unimaginable technical and operating capabilities appear on our public roadways, it challenges governments at all levels to rethink how best to manage and oversee our common infrastructure. With HAVs, a major challenge for government has been to foster a collaborative culture with the technology developers and vehicle

manufacturers that appropriately balances the goals of advancing the development of the technology along with ensuring the safety of the traveling public. The public's reasonable need for transparency can clash with the industry's reasonable need to protect its intellectual property; similarly the public sector's traditional risk aversion can put it at odds with the innovators' trial-and-error methods.

The good news is we are very early in the process of building partnerships, and, in Pennsylvania, a good-faith effort by all parties is clearly prevailing thus far. By understanding each other's needs, all the stakeholders can collaborate productively to advance the technology safely and bring about the benefits it promises for society broadly.

Some of these automated vehicles are being sold through alternate channels (for example online and not in dealerships). What restrictions are there on purchasing these high tech vehicles in PA?

While PennDOT is not aware of any fully operational Level 4 or 5 automated vehicle available for commercial sale yet, there are some automated features that are being implemented in late model vehicles or being sold as aftermarket add ones. PennDOT does not have direct oversight over the sale of such products, but to the extent that any vehicle is sold or modified, it would have to meet all applicable federal motor vehicle safety standards, and be property titled and registered to operate on a public highway in the Commonwealth. Additionally, the vehicle would have to pass an annual safety inspection.

Can AV's operate without painted lines?

Unless a route has been previously mapped and the tester undoubtedly knows the roadway hasn't changes, pavement markings are necessary for automated vehicles to operate. To our knowledge, all current testers require markings.

What's one take away that a locally elected official should walk away with from today?

Planning should begin now to determine the role automated vehicles will play in the future of the local community. From mobility for the disabled, transit, congestion management to future revenue sources. Start to bring these stakeholders and others together now to prepare and be ready for the deployment of HAV's. As we have noted in the past this isn't a question of if, but when, these vehicles will be introduced. Regardless of the answer to timing local, state and federal agencies need to be ready.

Do you foresee the Commonwealth owning any HAV's?

Yes, once they are commercially available. HAV's will offer cost, environmental and other efficiencies to PennDOT as well as other state agencies.

Will there need to be major improvements in infrastructure, such as signals, roadway markings, and signage for HAVs to operate efficiently, or are HAV systems able to operate sufficiently with current infrastructure?

Infrastructure requirements vary from manufacturer to manufacturer. Although some manufacturers can operate without vehicle-to-infrastructure communications, others view this communication as essential. Regardless of the approach, almost all manufacturers are open to communicating with infrastructure if the capability is present.

Do the policies being developed for AV include provisions defining how these vehicles and systems and the corporations or individuals that own them will contribute financially toward the supporting and funding of our public roadway and bridge systems? Does the committee see some type of statewide franchise fee or independent municipal franchise fees, like Comcast or other private entities using the public rights of way for financial gain?

Automated vehicles will be required to be titled and registered by Pennsylvania owners. This will be no different than what is required today. Today, funds from fee collection go to the Motor License Fund. A funding issue not directly related to automated vehicles is the growing use of alternative fuels. As the use of electric vehicles increases there will be a corresponding impact to gas tax revenue. PennDOT is developing plans on ways to encourage alternative fuel use while addressing revenue sources to ensure we have the funding needed to maintain our bridges and highways.