Nevada’s key partnerships at the intersection of transportation and technology, including on autonomous and electric vehicles, were in the spotlight last month as the CSG Transportation & Infrastructure Public Policy Committee convened during the CSG National Conference in Las Vegas. The meeting included remarks by committee vice chair Nevada Department of Transportation Director Rudy Malfabon, a discussion of CSG’s 2017 focus on autonomous and connected vehicle policy and industry and policy updates from officials representing the Association of Global Automakers, Audi of America and Uber.

Nevada Drives Transportation into the Future

Malfabon told attendees during the December 15 meeting.

In 2011, the state became the first to approve autonomous vehicle legislation. Then in September 2016 the state issued the nation’s first autonomous vehicle-restricted driver’s license to a quadriplegic man, who drives a modified Corvette using just his voice, head and breath to steer,
accelerate and brake.

Malfabon said Nevada’s innovations in transportation are to a significant degree possible due to a team effort that includes state, regional and local agencies and private industry partners. Malfabon’s department also works closely with four regional transportation commissions—what other states call planning organizations—throughout the state.

“There’s only four,” Malfabon said. “That’s something that’s easier to handle for us than some of your states (where) there’s a lot more of them. It can get very difficult to handle the politics of that.”

The Regional Transportation Commission (RTC) of Southern Nevada not only serves the planning function for the Las Vegas region, it also tackles transportation projects of its own and distributes funding from the federal government and fuel tax revenues administered in the region, Malfabon said. In addition, RTC operates a Traffic Management Center for the Nevada DOT, working with technicians and engineers to maintain intelligent transportation system devices and traffic signals on freeways and arterial roads in Clark County/Las Vegas and other cities in southern Nevada.

Malfabon also pointed to other key partnerships and projects that are putting Nevada at the forefront of transportation technology. Among them:

- The city of Las Vegas has been identified as an Innovation District and has begun installing sensors to communicate with a driverless shuttle that recently began operating in the city’s revitalized downtown. “You might have heard about a crash involving that [2] on the first day of deployment,” Malfabon said. “What happened was the shuttle was stopped. A truck was backing into an alley and the truck clipped the bumper of the shuttle. Not a serious crash but still it was the driver’s fault. What you see a lot with autonomous vehicles is they get in the news because of a fender-bender or a crash and it’s usually someone cut them off.”

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- The Nevada Department of Transportation and its transportation partners have worked with a company called Waycare to improve incident response times and reduce the length of traffic delays due to crashes.

- The state is partnering with neighbors Arizona, California and Utah to coordinate operations along I-15, an important freight corridor.

- Another private sector company, Genivi, is working to give drivers onboard, “augmented reality”-style warnings about unloading buses, pedestrian activity and traffic ahead in order to help improve pedestrian safety in Las Vegas and elsewhere.

- Nevada DOT has a research program to outfit snowplows with GPS and other technologies to communicate with roadway weather information systems in order to deploy snowplows in a more efficient manner.

- The department is also installing a conduit for future fiber optic, which will present opportunities to bring broadband access to rural Nevada.

- That infrastructure upgrade is also expected to benefit the Tahoe-Reno Industrial Center, a tech company-centric, 107,000-acre development in the Western part of the state, where Google recently purchased 1,200 acres and where Tesla in 2016 opened the Gigafactory to mass produce lithium-ion batteries for electric vehicles.
Nevada has become a leader in the electric vehicle front in a number of other ways as well, Malfabon noted. In 2015, Nevada Gov. Brian Sandoval unveiled the Nevada Electric Highway, a planned network of charging stations along U.S. Route 95 designed to make it easier to drive the sparsely populated route between Reno and Las Vegas in an electric vehicle. Since then, Malfabon’s department has identified a number of other alternate fuel corridors to the Federal Highway Administration. The Governor’s Office of Energy and power company NV Energy have sought to entice business owners to put in charging stations. State officials are also working with a private partner to deploy portable, solar-powered charging stations. And in 2017, Sandoval was one of the Western governors who signed a memorandum of understanding to create a regional network of electric vehicle recharging stations.

Malfabon said Nevada has seen success at the intersection of transportation and technology because it has taken a mostly hands-off approach to regulation.

“All of this technology, they call it disruptive and it is,” Mafabon said. “We have to figure out our way working with our industry partners. Our feeling is ‘let’s get out of the way ... Let’s make sure that we’re not putting these roadblocks in the way so that we can attract these companies and we can all work together to have success and eventually create jobs.”

**CSG Focus on Autonomous Vehicle Policy**

Following Malfabon’s remarks, CSG Director of Transportation & Infrastructure Policy Sean Slone gave a presentation on CSG’s 2017 focus on autonomous and connected vehicle policy. That focus included events in four state capitals during 2017 legislative sessions—Denver, Olympia, Hartford and Montgomery. Each event included a presentation from Global Automakers about the promise of autonomous vehicles and the peril of wading in too deep in enacting policy that could hinder
developing technologies and create a patchwork of laws around the country. The Griffith Insurance Education Foundation sent a speaker to each event as well to discuss the potential of autonomous vehicles to dramatically reshape the insurance industry in the years ahead. And each event included local speakers discussing what’s happening in each state to promote, test and research the possible impacts of autonomous vehicles.

Then in June, CSG brought a group of state policymakers from around the country to Detroit for a three-day policy academy focused on autonomous and connected vehicle policy. Speakers included representatives of the automotive industry, university researchers and state DOT officials, including Malfabon. The academy was highlighted by a visit to Mcity, the test facility operated by the University of Michigan in Ann Arbor.

Speakers from the automotive industry, representing Global Automakers, Auto Alliance, Toyota, Honda and General Motors, addressed the potential of autonomous vehicles to save lives and provide mobility to members of society who are not mobile today, including older Americans and individuals with disabilities. In addition, they spoke about the need for continued testing of autonomous vehicles in many different environments.

They also emphasized that full automation isn’t going to happen overnight. The Society of Automotive Engineers has defined six levels of automation that range from level 0 for no automation to level 5 for full automation. Major automakers have vehicles with level 1 and level 2 automation technologies on the roads right now with features that are helping to improve safety. Tesla has introduced level 3 vehicles, which still require a driver to remain engaged and ready to take over in case something goes wrong. Level 4 high automation vehicles will see deployment first as unmanned shuttles in self-contained environments.

Many automakers are concerned that state autonomous vehicle legislation can be problematic. Nevertheless some 70 bills were introduced in 33 states in 2017 and 14 states passed some kind of new law, including Nevada. Governors in three other states issued executive orders. The approved measures sought to do a number of different things, including allowing truck platooning or testing on roads in the state, pre-empting local regulation of autonomous vehicles, putting a specific state agency in charge of regulation, authorizing pilot programs, addressing licensing, registration and insurance issues and authorizing new studies or advisory panels on autonomous vehicles.

One panel in Detroit focused on the “Federal Automated Vehicles Policy,” first issued in September 2016 by the National Highway Traffic Safety Administration and updated in 2017. Another panel looked at the potential impact of autonomous vehicles on the economy and, in particular, on driving and trucking jobs.

Several speakers in Detroit also addressed a vision for the autonomous future that involves on-demand, shared-use mobility with fully electric, autonomous vehicles. But, as policy academy attendees heard, that future is not guaranteed and policymakers will likely need to consider enacting the kinds of policies to enable a favorable future not only for the industry but for society as a whole.

Updates on Autonomous Vehicle Industry & Related Policy

The Las Vegas policy committee session wrapped up with three industry perspectives on the autonomous and connected vehicle policy landscape. Attendees heard from Josh Fisher, Manager of State Government Affairs at Global Automakers, Brad Stertz, Director of Government Affairs at Audi of America and Justin Erlich, Head of Policy, Autonomous Vehicles & Urban Aviation at Uber.
For us and our members, vehicle safety is the most important factor that we consider and it’s the highest priority in how we build and design our vehicles,” Fisher said. “Unfortunately, vehicle fatalities are increasing year over year. The 2016 number was an increase over (2015) and (2015) was an increase over 2014. ... That’s happening despite the fact that vehicles structurally are safer than ever and it’s really due to human error and so when we talk about autonomous features and automated technology, they really do hold the promise to put us on the road to zero fatalities, zero crashes so it’s really important that we get the policy right, we take a measured approach.”

Fisher said Level 1 and 2 automation technologies available in cars on the market now are already helping to improve safety. Those include features like adaptive cruise control, lane-keep assist, lane departure warning, blind spot protection and cross-traffic alert.

“As more features come to the market, the safety benefits continue to grow,” he said. “It’s not just at Level 4 or 5 that we’re going to see safety benefits. When Level 4 and 5 vehicles are deployed, it’s going to be in a fleet model probably in urban areas, very tightly controlled, geofenced. ... If you look at the fatality numbers, vehicle fatalities occur at a higher rate in more rural areas so if we’re not focused on all levels of automation, levels 0 through 5, we’re going to deny safety benefits to the majority of people. It’s going to be great when the highly automated vehicles are deployed in those urban environments but we also need to make sure when we consider policy options that we’re tech-neutral and we’re not favoring 4, 5 at the expense of 1, 2 or 3. Unfortunately we’ve seen that in some states.”

Fisher said as autonomous vehicle technologies continue to develop, it will be important to also develop vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communications.
“With those technologies working together, that’s really where we’re going to achieve the maximum safety benefit,” he said.

Fisher noted that automakers would like the federal government to be more involved in V2V communications and to help resolve a dispute with telecom companies over the wireless bandwidth that could be used for such communications. The Trump administration has reportedly decided not to pursue a mandate that would require cars and light trucks to come equipped with V2V technology.

As The White House was reaching that decision though, autonomous vehicle policy was the focus of debate at the other end of Pennsylvania Avenue last year as the House and Senate considered two different pieces of legislation.

“We as an organization support both chambers’ efforts to get something done ... and I think that bill will go a long way toward helping to further define the roles of the states and the federal government,” Fisher said.

The Senate’s version of the bill didn’t get a floor vote at the end of 2017 as several Senators placed holds on the bill. But some remain hopeful it can clear the chamber and eventually be signed into law during the first quarter of 2018.

As for the National Highway Traffic Safety Administration’s federal policy document, Fisher said version 2.0 issued in 2017 was an improvement over the 2016 version. NHTSA is also already working on version 3.0, which Fisher expects to be more multimodal and expansive in scope.

Fisher said he is often asked about the timetable for deployment of autonomous vehicles across the fleet but he contends that’s not really the question people should be asking.

“I would pose that policymakers should be asking ‘how do we position ourselves to support the deployment of automated technology today and into the future?’” he said. “Automated features are already here. Automated technology is already in the market so it’s not really a question of when but what you can do to really promote the technology.”

Fisher advises that states should be flexible and cautious in enacting legislation because there is always the danger of enacting something that will be outdated six months later.

“There are many ways you can act to promote this technology without codifying definitions that are changing ... or favoring technologies.”

But Fisher also said while the roles of the states and federal government in autonomous vehicle policy are important, so too are the roles of cities and counties.

“The most likely scenario for the first deployment of highly automated vehicles will be in urban environments and so cities are going to play a crucial role in determining how this works,” he said. “The federal government is focused on safe design of highly automated systems. These metropolitan communities will play a critical role in advancing this technology. Cities will have to think about transportation today and in the future differently. It’s about mobility, connectivity and sustainability.”

Fortunately, policymakers of all stripes should have time to get the policy right, said Brad Stertz, director of government affairs at Audi of America.
“Autonomous vehicles are not going to appear magically overnight in every city and every state around the country and around the world,” he said. “Our vision is that (they) will appear in different cities and at different scales so we’re going to have time over the next five, 10, 15 years to really figure out how these things are being deployed, what the rules of the road are—most importantly for states, and how they actually function on the day-in and day-out factors of transportation.”

Stertz spoke about the potential of autonomous vehicles to serve two groups that don’t have access to mobility options today—older Americans and individuals with disabilities.

“Every day 10,000 baby boomers are retiring in the U.S.,” Stertz said. “Twenty-five states in the U.S. require elderly drivers at some point to go in and certify they can still see or they still have the ability to operate a motor vehicle. That means in five to 15 years, you’re going to have a mountainous, generational wave of people who are basically stranded in their homes. ...The same thing goes for people with disabilities. There are 57 million people roughly ... who have a disability (in the U.S.). At least six million—more than 10 percent of those folks—have difficulty finding transportation right now.”

Of the legislation Congress is considering, Stertz said he too remains optimistic about the direction it appears to be taking. He said states should not be concerned about the legislation preempting states’ authority on autonomous vehicle regulation.

“Really the preemption part is to take the authority NHTSA has and extend it to a level of vehicle that nobody ever imagined before,” he said. “NHTSA takes 10 years to come up with a (Federal Motor Vehicle Safety Standard) and we just don’t have 10 years to let that go through that whole process. On the flip side of that, they don’t have the data to create a safety standard so we’re caught in this
chicken and egg process. ... Preemption is simply to take NHTSA’s authority for the performance and design of the vehicle and establish the federal authority over that so there isn’t a 50-state variance of how the car should be designed and operated.”

Stertz noted the legislation would also allow larger test fleets than the 2,500 vehicles currently allowed.

One of Audi’s test vehicles, known as “Jack,” which was displayed and demonstrated around the country (including at the CSG 2016 National Conference in Colonial Williamsburg, Virginia) was recently decommissioned because despite the fact that it performed nearly flawlessly as a test vehicle, it no longer represented the latest technology, Stertz noted.

Stertz said the rapid advancement of autonomous technology presents a significant dilemma for both the industry and policymakers because that pace of change is on a completely different timetable from industry vehicle development cycles, federal safety standard-setting cycles, municipal infrastructure improvement schedules and fleet turnover cycles.

“This is the very difficult balance we sort of have to all work together on to make sure these timelines make sense and we’re not making decisions now that cause problems later on down the road,” he said.

Another difficult balancing act involves the aforementioned desire many have to ensure that automated vehicle technology evolves simultaneously with electric vehicles and shared use mobility options—something researchers at the University of California Davis have dubbed the 3 revolutions.

“It’s easy to kind of look at all these things in silos and sort of solve one problem but these things are all going to come together and they’re going to come together by the middle part of the 2020s,” Stertz predicted. “It’s going to be incumbent on states and cities to understand where they can set up electric vehicle charging for these fleets to maximize their ability to serve the public.”

Stertz said the full implementation of automated vehicles has the potential to bring down the per-mile cost of transportation from about $3.50 a mile to about 35 cents a mile, which will help address important transportation access and equity issues.

“You can see the economic impact that has on people who have difficulty getting around from a convenience sense but also from an economic sense,” he said.
The intersection of the three revolutions will present a number of policy challenges in the years ahead. In addition to lost gas tax revenues from electric vehicles, autonomous vehicles will present another loss of revenues in the form of registration fees once there is a transition from a vehicle ownership model to a subscription model where vehicles are shared and are part of fleets.

"I think there is going to be a lot of subscription model opportunity," Stertz said. "It’s going to be a big market. I don’t think it’s going to completely replace the owned-vehicle model and we intend to kind of work both ends of that. ... It’s going to be a transition and what it will mean also is the importance of multimodal (transportation), where you may have your own car, drive to a mass transit station if it’s available or some other kind of transportation hub, get into a center of a city and then use a lower-speed (autonomous) shuttle to get around within the city."

With more autonomous vehicles on the road, Stertz said it will be possible to modify infrastructure to accommodate vehicles that can travel more closely together in platoons. Autonomous vehicles are also expected to take up a smaller footprint of the built environment.

"If you can park cars right next to each other so you don’t have to open the doors to get out, that will drastically reduce the footprint of parking in cities," he said. "Downtown (Los Angeles) has one third of its real estate tied up in parked cars that are basically sitting there in the sun or in a garage for eight, 10, 12 hours a day doing nothing. If that can be reduced and a better use made of the land in terms of better commercial or residential or even public space, that’s a huge opportunity."

Justin Erlich, the Head of Policy, Autonomous Vehicles and Urban Aviation at ride-hailing company Uber, also sees the potential for repurposing land now dedicated to parking.

"I think we’ll start to see the shape of the city really change drastically," he said.
According to Erlich, Uber believes there are not three but four revolutions that must be orchestrated to ensure the ideal autonomous future. The fourth, he said, is to once again recognize the value of something that saw perhaps its greatest popularity in the late 1970s—carpooling.

“...We think technology will enable the communication mechanism to carpool in an easier way,” he said. “If we reduce the cost of (autonomous vehicles) … and enable everyone to travel by themselves, demand will increase naturally and so we would run the risk of having our roads continue to be more congested. ... I would encourage any local and state policymakers to think about what are policies that we need to do to encourage carpooling so we continue to increase the access and mobility to all while minimizing the number of cars. ... Whether that is a congestion charge, high-occupancy vehicle lanes or some other sort of mechanism, that is pretty critical.”

Uber hopes one of its services, uberPOOL, can play a key role in facilitating carpooling. For now though, the company has deployed self-driving vehicles as part of the fleet serving its standard UberX offering in two cities—Pittsburgh, Pennsylvania and Tempe, Arizona.

“Our network will be for the foreseeable future a mix of human drivers and autonomous vehicles and we think that is in great part because there will be many roads and routes that will be better served by a human driver,” Erlich said. “We think that having a mixed network is a real critical component of being able to serve riders wherever they want to go.”

Erlich said Uber is also thinking long and hard about the potential of autonomous vehicles to impact driving jobs.

“We’re currently also working on developing technologies that will allow long-haul trucking to be serviced by autonomous vehicles, which will also then enable more short-haul trucking jobs that will
be done by traditional truck drivers,” he said. “We think that the timing of when that will all roll out will actually be valuable to help staunch the driver shortage without getting into a lot of truck-driver displacement.”

Erlich said he’d like the federal autonomous vehicle legislation under consideration to begin to contemplate trucking as part of the autonomous ecosystem, something the Senate’s version of the bill does not do.

Erlich also emphasized the potential impact of autonomous vehicles on traditional funding streams as a key issue for policymakers.

“As we move to a world where there is less parking, there are fewer tickets issued,” he said. “We are moving from gas to (electric vehicle). There’s a whole set of intertwined funding streams that will be reduced and so everyone will want to be very thoughtful about how those are recovered. ... We do want to make sure that whatever taxes or charges are ultimately put in place incentivize the behavior we all want to see in the end. One risk of putting incentives or taxes only on certain types of new technologies that we want to see is it may slow down or change the economic analysis for some other existing technology. We would just encourage everyone to think about the systemic impact.”

Further Reading