PNWER Working Group Session Report

Working Group: Automated Connected Electric Shared Vehicles (ACES)
Meeting Date/Time: Tuesday, July 24, 2018 / 2:30pm
**Broadcast by TVW**
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Co-Chairs:
- Senator Chuck Winder, Idaho
- Bruce Agnew, Cascadia Center

Speakers
- Kyle Quinn, PACCAR
- Steve Marshall, City of Bellevue
- Jake Fey, Washington Legislature
- Reema Griffith, Washington State Transportation Commission
- Jeff Marker, Idaho Transportation Department
- Joel Fisher, Verizon Smart Communities
- Matthew Hepner, Certified Electrical Workers of WA (IBEW)
- Jeff Allen, Forth
- Jeffrey Phillips, Dawson Strategic
- Rendall Farley, Avista

Agenda Items
- Is the public ready for an ACES world?
- Transportation electrification to boost economies and enhance the environment

Summary of Meeting

Kyle Quinn, CTO, PACCAR

Kyle Quinn began the session with a presentation on PACCAR’s new truck platooning and automation projects. PACCAR is one of the largest manufacturers of heavy and medium size trucks in the world. They are currently developing numerous aspects of their fleet that further ACES in the trucking industry. Recent projects include zero emission 150-mile range electric trucks, radar systems that allow lane departure warnings and auto-docking, and remote diagnostics capabilities that anticipate repairs and communicate with service locations to schedule repairs. With over 200,000 connected trucks currently in operation, PACCAR is collecting more and better data than before and leveraging it into new technologies. Safety, social acceptance, and economic feasibility will guide upcoming PACCAR technology developments.

The PACCAR Innovation Center in Silicon Valley, established in 2017, includes a truck lab, office, and showcase area. The Silicon Valley location has enabled PACCAR to join the bay-area’s tech ecosystem and foster collaboration with numerous tech firms. The output from
the innovation center includes a level-4 (high autonomy in limited situations i.e. highway driving) autonomous truck with cameras and radar, and an anticipated release in the 4th quarter of 2019. Currently, multiple models of electric, battery electric, and hybrid electric trucks are in the development with mileage ranging from 25-250 miles. Many European regulations will soon require zero emission The DAF CF Electric premiered this year in the Netherlands, four more will be released this year.

Steve Marshall, Transportation Technology Partnership Manager, City of Bellevue, WA
Bellevue wants to be on the forefront of Advanced Transportation and Congestion Management Technologies Deployment (ACTMTD). A coalition of Bellevue-area businesses recently applied for a major grant to help them achieve this. At the state level, Washington has Target Zero: a formal goal for no deaths or serious injury in motor accidents, reduce emissions, reduce congestion and vehicle miles traveled. But right now, Washington is moving backwards in all areas. Mr. Marshall believes ACES is the key to addressing every component of the state’s transportation goals. A primary question is: how do we get more people into fewer vehicles? Currently, vanpools are fixed, they need to be flexible, and electric. Amazon is developing an app that could make vanpools more feasible at larger scales.

Jake Fey, Representative, Washington House of Representatives
The PNWER region is the most conducive business and political environment to developing electric transportation technology. WA is committed to reducing greenhouse gas emissions. While this is sometimes presented as a requirement, it is actually an aspiration. We need to develop a binding plan to ensure this goal is met. Washington has a solid legacy of clean electricity production, like the Grand Coulee Dam. The new electrification goal is 50,000 charging stations in the state before 2020. Unfortunately, the sales tax break for electric vehicles expired in May 2018. A commercial vehicle tax credit for B&O and public utility natural gas and electric vehicles is still in place. EV infrastructure bank creates a $50 fee on EV until first $1 million to go to EV infrastructure bank and a $150 registration fee that goes toward motor vehicle fund. An upcoming issue is: how do we get the EV privileges to communities that are not buying new cars?
Next steps:
- Revive the sales tax break for electric vehicles
- Expand EV infrastructure bank
- Improve electricity infrastructure: public and private IOUs—level the playing field on EV infrastructure
- More than half of the state’s residents are in public utility territory (this presents challenges to funding EV infrastructure because private utilities can make that EV infrastructure investment but because of the lending of credit constitutional prohibition, we cannot do that for EV infrastructure that is a public utility.)

Reema Griffith, Executive Director, Washington State Transportation Commission
The legislature passed SHB 2970 which creates an advisory body on autonomous vehicle implementation. It monitors national and local development in autonomous vehicle testing policies and brings together relevant parties. The group’s scope includes private ACES
vehicles and commercial vehicles (like PACCAR), and considers the interaction between the two, considering that the commercial sector is further along and likely to hit the street much sooner. Their goal is to figure out which laws should be changed and implemented, while avoiding the tendency to overregulate. AV Work Group Executive committee has 5 subcommittees with 2 Co-Chairs—one public and one private sector. A key question: what are the insurance implications of autonomous vehicles on the road?

**Jeff Marker, Freight Program Manager, Idaho Transportation Department**

The Idaho Transportation Department is working to incorporate emerging tech into the existing Idaho transportation network. In January 2018, the Idaho government established a committee for testing ACES in ID. The committee is very interdisciplinary with engineers, law enforcement, legislators, private and public sector. They are tasked with identifying jurisdictions in the state with any relationship to these processes. Like Washington, Idaho is identifying and revisiting any laws or regulations that are related in any way to the development of ACES.

A major shift in public thinking would be treating mobility as a service, and eventually eliminating the concept of car ownership. This is highly disruptive to several industries such as insurance because manufacturers and service providers will possess greater liability. Codes in several states, repair shops are non-liable to repairs following repairs they have made on automated vehicles.

Another important question: how will this affect rural communities, especially those that don’t have adequate Wi-Fi. What Wi-Fi alternatives will fill this gap? It is likely that there will be infrastructure requirements for communities to embrace this tech. ID is also working on traffic signal synchronization with public transportation.

**Joel Fisher, Business Development Manager, Verizon Smart Communities**

ACES will necessitate broad 5G (5th Generation) deployment. Where 5G will be most groundbreaking: healthcare, VR/AR, and ACES. 5G is 10-100x faster than current speeds and far more responsive (4G is 200ms average responsiveness, 5G less than 1ms). This has huge ramifications for ACES, the stopping distance for an autonomous vehicle traveling 30 mph goes from 4.6ft to less than 1 inch. Verizon is also developing Traffic Data Services software to monitor safety in real-time. They also offer safety analytics sensors that can monitor at the street, curb, intersection scale. This enables a proactive approach to traffic safety. The demand for 5G is already huge, and will only grow in the coming years. Mobile data consumption is up 35X from 2010-15.

Audience Questions:
Sen. Dean Takko: If you really need a robust 5G network, and 5G is not going to cover everyone (at least in the short term), how will we make ACES work during the transition?

Joel Fisher: We will incorporate ACES wherever we can with whatever technology we have available. However, 5G coverage will rapidly get better. One small issue: 5G signal does not travel as far, and thus requires more towers more often. Industry wide, 330,000 towers have been deployed in the last 20 years.
Kyle Quinn: PACCAR is compensating for the lack of telecommunication infrastructure by packing each truck with a massive amount of high-definition maps etc, which is very costly.

Isaac Kastama, Washington Business Alliance
What are the benefits of electrification? Cost: higher upfront but much lower usage cost. EV is much more efficient than combustion engine as well. It is true that EV is only as clean as the grid. Because EV is so much more efficient however, it consumes less energy and thus less carbon emissions over the whole supply chain. In more densely urban areas these advantages are even more profound.

Jeff Allen, Executive Director, Forth
Electric cars are far more efficient than regular cars, they are equivalent to a 94 MPG car. For people who are skeptical of ACES, remember that vehicle sharing like Uber/Lyft was non-existent 6 years ago, and electric cars 10 years ago. These have fundamentally altered our transportation infrastructure, and ACES will do the same.

To quantify the effect of EV, every electric vehicle has about $2000 worth of societal benefits. Improvements in transportation are second only to improvements in housing in terms of household benefits. Driving electric is the equivalent to driving on $1/ gal. Oregon alone spends $6 billion on gas and diesel. All this money leaves the state because Oregon doesn’t refine or produce oil.

The number one barrier to electric vehicle adoption is consumer engagement. Consumer familiarity with electric vehicles has not changed in the last 6 years. This means there needs to be more effort on the part of other stakeholders to increase community awareness and engagement.

Electric vehicles have different community needs than combustion vehicles. Increasing EV presence in low income communities is an important goal. In OR, WA, CA, there are concerns about these tax breaks exacerbating inequality. In Oregon there is a $2500 rebate on EV, but there is an additional $2500 rebate for low and moderate income consumers. These can be used on used vehicles. With more and more used EV's hitting the secondary market, this rebate makes an EV a very realistic purchase for moderate income consumers, and with the reduced operating costs, EV could be a force for income and mobility equality. Forth is also working to bring charging stations and additional technology support. Low and middle income people are a much larger part of the car market than people may assume. Further, low income people are more likely to purchase cars which are cheap up front but expensive to maintain.

Matthew Hepner, Certified Electrical Workers of WA (IBEW)
The building code council mandates that in new construction for commercial and multi home compartments there needs to be a room for the circuit breakers, 20% of all new parking spaces need to be preset for electric vehicle charging. In the national electric code, there are 3 levels of volts which mandate how long it will take to charge your car. The charging stations need to be practical and designed in a way that is practical. We could use a standard EV charging outlet.
Rendall Farley, Avista
Mr. Farley reemphasized the economic benefits of electricity. Charging ports are needed every 40-50 miles among main travel corridors, and need to be capable of 15-20 minute charging. A potential problem is that EV adaptation is being driven in part by high gas prices, what will happen if/when gas prices drop?

Jeffrey Phillips, Managing Director, Dawson Strategic
EV is being quickly being implemented for work trucks (trucks designed for a specific purpose, and built at lower volumes). They are part of municipal or commercial fleets. In Canada, there is a patch work of policies which are designed to reduce emissions from the transportation sector.
The framework’s 3 main elements are:
- Heavy duty GHT emission regulations which are in alignment with the US which bring increasingly stringent regulations on the heavy duty sector
- Clean Fuel Standard GHT reduction in buildings, transportation
- Advancement of Carbon pricing: by 2018 all jurisdiction need to have a carbon pricing system.
The federal will be releasing a zero emission strategy for passenger and light duty vehicles later this year. The carbon pricing regimes in Ontario are being dismantled with the recent government change.

There is no single technology or policy solution. A combination of both is necessary. As Mr. Quinn mentioned, ACES generated data can be used to inform policy and innovation decisions going forward.