

Beyond Technology:

Policy and Planning Effects on Deployment of Connected and Autonomous Vehicles



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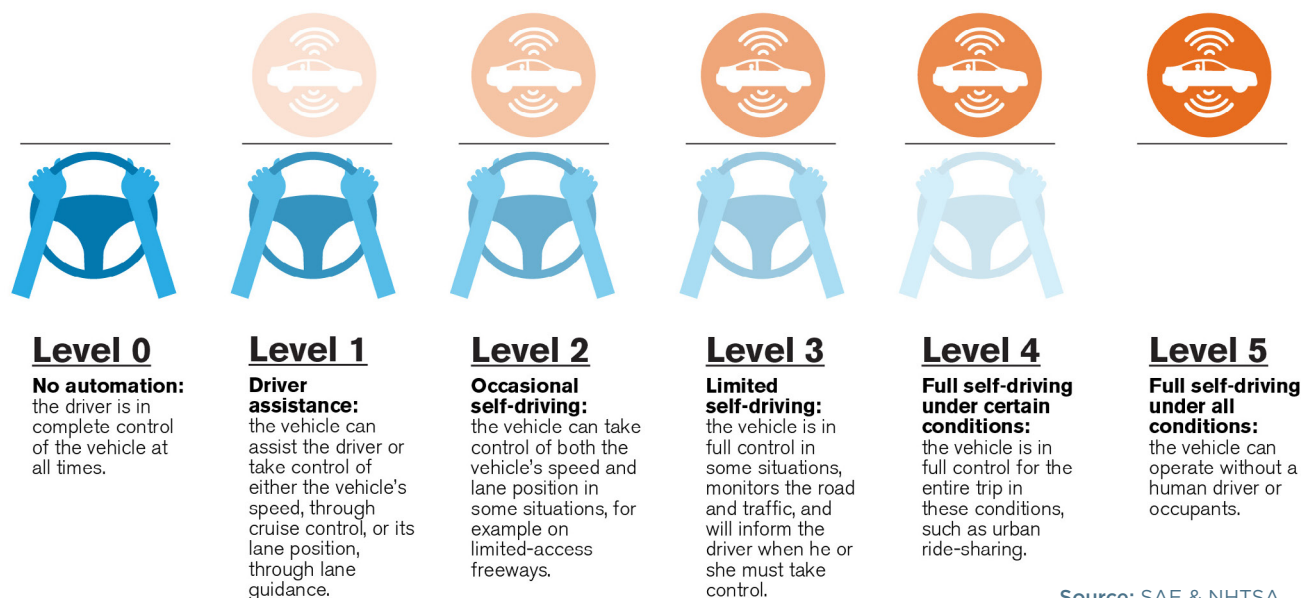
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Innovation and technology are disrupting the traditional transportation landscape at a faster rate than perhaps any time in history. The past decade has seen rapid evolution of technology, from smart phones to all-electronic tolling to the introduction of connected and autonomous vehicles (CV/AV). AVs, also known as driverless cars or self-driving cars, operate in isolation from other vehicles—and without assistance from infrastructure—using internal sensors, such as Lidar, GPS, radar, ultrasonic, and cameras. CVs use computing and sensing technology and wireless communication to collect and share information between vehicles, with the infrastructure, or with other mobile devices. Combining the two technologies offers the full potential benefits and broad-scale implementation of

automated vehicles. While advanced technology is a vital component to making CV/AVs a reality, achieving successful widespread deployment will require the convergence of many factors, including policy, infrastructure, industry, and society.

Federal legislation and regulations influence the development of policies and guide decisions at the state and local levels. Policies are implemented through long-range or mobility planning and project programming. Both policy and planning are key to advancing the deployment of CV/AVs, yet perspectives differ at the national, state and local levels. As the CV/AV initiative moves forward, aligning Federal, state, and local agencies presents a unique set of challenges and opportunities.

Five levels of Vehicle Autonomy



Policy Issues and Challenges

Talking the Talk

State departments of transportation (DOTs) have been tasked with doing more with technology, yet technology is an ambiguous term. At a national level, there exists a need for a common language to be established. Terminology associated with CV/AVs is not widely understood within the industry, let alone from a public perspective. Current Society of Automotive Engineers (SAE) standards are not enough and require translation for the average lay person to understand. Public outreach and education needs to be a focus area, with participation from CV/AV implementation teams.

New Technology, New Risk

While advancements in technology can bring new benefits for the transportation industry, so too can they present new risk. Liability issues, including private liability, hacking liability, and micro insurance are all personal coverage concerns surrounding ownership of driver data. Currently, there are more questions than answers, including:

- » Who owns the risk for crashes in automation?
- » How will vehicles be insured?
- » Who teaches the consumer how to use the new technology?
- » What happens when vehicles are retrofitted?
- » How can we provide and confirm certification if data is being sent to/from technologies?

In a market that has become oversaturated with information, it is difficult to know who and what to listen to or where to turn for answers. Currently, technology is leading the conversation around CV/AVs, but presents different motivations (profit or freedom). Following technology may put consumers in jeopardy. Regulations should protect consumers, but the current lack of Federal legislation is inhibiting policy making at the state and local level. State DOTs are risk adverse, often reactionary to industry happenings based on consumer acceptance. Additionally, and outside of the government's control, original equipment manufacturers (OEMs) are influencing consumers, claiming they can deploy highly automated vehicles by 2022, using safety as a promotional tool to attract buyers.



Planning Opportunities

Balancing Regulation with Innovation

We are currently experiencing the availability of technology before agencies can plan for changes to infrastructure. As technology continues to evolve, advancements will change the way we think about transportation and how we approach policy and planning. While some predict fully autonomous vehicles on the road by 2020, there remains much uncertainty about adoption rates. The government's role is to establish policy and security; provide guidance, standards, tools, and resources; invest in research, best practices, and lessons learned; and encourage development and deployment that incorporate safety, mobility, and sustainability.

Many agencies are seeking mobility strategies that consider a comprehensive, more attractive transportation approach versus a traditional restrained planning process, with long-range plans now being referred to as mobility solutions. This approach allows agencies to think about their multi-modal, land use, and environmental needs for mobility and not just planning for projects that reduce congestion over a specified time. At the state and local level, agencies must consider how implementing CV/AVs will change how we do business. Local challenges include:

- » Curbside and sidewalk management
- » Parking needs
- » Traffic impact shifts
- » Roadway allocations
- » Transportation fees and revenues

State and local agencies need to begin planning now for the future of CV/AVs. This includes maintaining flexibility in innovation and designing with adaptive reuse in mind.

The Value of Connectivity

As we move towards the future of CV/AV, connectivity will be critical—and is already a major issue between manufacturers, Federal government, and state DOTs. Connectivity provides an added level of information for vehicles, system users, and system operations. The transition period may be unknown, but we do know that we will be in a mixed-use society for a considerable time. In the U.S., we have built out a strong communications network to avoid a patchwork system and provide interoperability across jurisdictions, increasing the value of investment in network mobility. Users want a reliable system. Connectivity will improve the reliability of the system no matter who operates the facilities.

Collaboration Can Drive Advancement

Nationally, tools to model and forecast behavior do not exist, resulting in a moving target of conditions and user preferences. Transportation agencies, in a lot of states, are having a difficult time keeping up with the advancement of technology, which is being driven by private investment. States with experience balancing infrastructure funding through public-private partnerships (P3s) can serve to educate others. P3s allow for shared risk of experimentation with infrastructure and other new costs associated with CV/AV testing and deployment. Data sharing could allow for vehicle miles traveled (VMT) location-based charging and dynamic cost adjustments per mile based on locations of congestion/policy desires for less vehicle use (i.e., more pedestrian-, bicyclist-, transit-serving locations).

As the road to CV/AV deployment progresses, there are things that agencies at the state and local levels can be doing now to help advance the cause. This includes:

- » Considering state fleets as a rollout opportunity
- » Coordinating mega-regional partnerships to identify opportunities
- » Incorporating regulations and guidance into planning activities

How VHB Can Help

- » Building CV/AV as a tool into Metropolitan Transportation Plans (MTP) and Transit Asset Management (TAM) plans
- » Developing a national data sharing architecture to get public and private sector working together

Above all, agencies at all levels—national, state, local—must make certain that CV/AVs follow the rules of the road. If deployed smartly, CV/AVs have the potential to:

- » Improve safety through the reduction and mitigation of crashes
- » Increase mobility and accessibility by expanding roadway infrastructure capacity, enhancing traffic flow dynamics, and offering more personal mobility options of disabled and aging population
- » Reducing energy use and emissions
- » Increase demand for new jobs

VHB's professionals are passionate about making meaningful contributions to the world through the work that we do. We're a team eager to deliver value by embracing our clients' goals, anticipating challenges, building lasting partnerships, and always providing a smooth ride. Contact [Cheryl Lowrance](#) today to learn more about our innovative and forward-thinking integrated service solution approach and how we can help you navigate the future of CV/AVs. Client partners we are already helping as they plan for CV/AV deployment include:

- » Working with the Florida DOT to prove interoperability and develop Statewide standards for CV equipment
- » Coordinating software development to interface with all signal controller manufacturers for regional Integrated Corridor Management (ICM) strategies
- » Intelligent Transportation Systems (ITS) Strategic Planning in Raleigh, including planning future CAV technologies
- » ITS Strategic Planning and Signal Phasing and Timing (SPaT) deployments at intersections in Maine
- » Long-range transportation planning for the Rhode Island DOT, including development of CAV scenarios
- » Facilitating CV/AV Communications for the Massachusetts DOT, with more than 35 locations upgraded to include Dedicated Short-Range Communications (DSRC) along Route 9 from Worcester to Wellesley as part of SPaT challenge
- » Planning and designing more than 40 location adaptive signal control systems for the South Boston/Waterfront area
- » Development of Autonomous Transit Justification Reports, including for the City of Orlando
- » Providing sustainability, transportation, and parking services related to Smart City efforts