Introduction

Automated vehicle (AV) technologies are rapidly evolving, and many states have developed legislation to support AV testing and deployment and to ensure safety on public roads. This research provides a synthesis of issues addressed by state legislation and a discussion of issues related to AV regulation.

States are interested in supporting AV because the expected benefits include increased safety, increased capacity, and decreased congestion. Other expected benefits include increased productivity due to hands-free travel and increased mobility for people unable to drive themselves. The projected economic impact of AV is significant, with an estimated market of $7 trillion by 2050. Although speculative, this value indicates the dramatic impact that AV may have on the future of transportation. The benefits of AV may be significant, but there are also challenges, including the potential for increased costs, liability issues, licensing issues, security concerns, privacy considerations, and cybersecurity issues, as well as job losses in the transportation sector.

Findings

Legislative responses to this technology have varied significantly, depending on the state. Currently, twenty states and the District of Columbia have passed legislation related to AV, and four states have executive orders, as shown in Figure 3.1 of the report. The framework for AV is still evolving at both the national and state levels. At the national level, the National Highway Traffic Safety Administration (NHTSA) published the Federal Automated Vehicles Policy (FAVP) in 2016. This document provides guidance rather than regulations, and sets forth a standard framework for levels of autonomy, as shown in Table 2.1 of the report, as well as guidance on vehicle performance, a model state policy, and current and future regulatory tools.

The levels of autonomy shown in Table 2.1 provide common terminology for agencies and industry. Level 0 (L0) reflects no automation and level 5 (L5) reflects full automation. As automation increases, the responsibility for operation transitions from the human operator to the AV. The primary distinction between conventional vehicle operation (L0, L1, and L2) and a highly automated vehicle (HAV; L3, L4, and L5) is the responsibility for monitoring the environment. (This document uses the term HAV for L3, L4 and L5 per the FAVP convention; HAV is not an acronym for “high automation,” which is the name for level 4 as referenced by SAE.)

The third component of the FAVP is the model state policy, which clarifies federal and state responsibilities with respect to AV and supports seamless operation from one state to another. According to the FAVP, state AV responsibilities include driver licensing and vehicle registration, traffic laws and enforcement, safety inspections, and motor vehicle insurance and liability. State legislation often addresses licensing and registration, and insurance and liability, but has less commonly addressed traffic laws and enforcement or safety inspections. Nevada was the first state to enact legislation in 2011; this legislation provided definitions, authorized operation, and directed the Department of Motor Vehicles (DMV) to develop rules for licensure and operation. Subsequent legislation for different states has varied significantly. In some states, legislation is minimal and may focus on the legal definition of AV and related concepts. In other states, test programs are authorized, operational limits are placed on AV, and/or funding for AV activities are allocated.

States that were early adopters of legislation have often passed new legislation to clarify, expand, or modify the original framework for AV. This reflects the changing context for AV testing and operation. The need for flexibility can also be addressed through sunset provisions in legislation or through legislation that delegates responsibilities to state agencies for program development and oversight.
State legislation and executive orders were reviewed to determine whether they addressed the following topic areas, as shown in Table 2.2 of the report.

1. **Definitions.** Definitions are one of the most basic components of legislation and may stand alone or be part of more comprehensive legislation.

2. **Study request.** Existing agencies may be tasked with studies, or committees of stakeholders may be responsible for studies of broad issues related to AV or specific functions; studies may require a single report to the legislature or have annual reporting requirements. This is a topic addressed by all the executive orders and by most of the enacted legislation.

3. **Licensing and registration.** Driver licensing and vehicle registration programs are commonly addressed in legislation, reflecting traditional state responsibilities.

4. **Insurance and liability.** States have well-developed criteria for insurance and liability, although minimum requirements and allowable programs (e.g., no-fault insurance) may vary from state to state.

5. **Vehicle inspection requirements.** Some states elect to conduct vehicle inspections to ensure minimum safety or emissions standards are met.

6. **Operator requirements.** The requirements for operators vary from state to state and in some cases for different levels of automation.

7. **Infrastructure.** Infrastructure to support AV may include communications or signal systems equipment and connected vehicle (CV) technologies, as well as traditional components such as lane markings and signs.

8. **Vehicle testing on public roads.** The FAVP defines testing as the deployment of HAV by manufacturers or researchers to evaluate and analyze operations.

9. **Operation on public roads.** The FAVP defines operation as the use of HAV by members of the public who are not manufacturers or researchers.

10. **Commercial vehicle operation (CVO).** CVO may have additional requirements such as commercial driver licensing, vehicle inspections, and permitting. Recent legislation in a number of states has addressed vehicle platooning targeted specifically to the CVO market.

11. **Privacy.** Privacy concerns are an important consideration and include vehicle data that conveys vehicle location, as well as operational characteristics, particularly during or preceding an accident.

### Implementation

State laws may be intended to facilitate AV and associated economic development; however, state legislation is just one of many factors that affects AV activity. In many cases, legislation may not be necessary for AV to operate legally, and it may not be a catalyst to spur AV activities. As noted by one technology firm, “It is the lack of regulations that really makes Arizona attractive. In the U.S., if it isn’t illegal, it’s legal. Arizona hasn’t passed laws on the subject—that actually makes it easier to operate there.”

In addition to legislation, some states have developed partnerships with industry and research institutions, investments in infrastructure, and formal requests for proposals for AV partnerships to foster AV activities. States have taken a variety of approaches to AV legislation, and similar legislation has had different outcomes in terms of AV activities. Even if federal legislation is passed, it is expected that there will still be an important role for states for AV licensure, registration, insurance, traffic laws, enforcement, infrastructure, and emergency response. The review of topics addressed in current state legislation provides a frame of reference for Indiana decision makers to consider as they develop strategic plans for AV in Indiana.

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