

Self-driving vehicles offer potential benefits, policy challenges for lawmakers

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Self-driving vehicles offer the promise of significant benefits to society, but raise several policy challenges, including the need to update insurance liability regulations and privacy concerns such as who will control the data generated by this technology, according to a new RAND Corporation study.

"Our research finds that the social benefits of autonomous vehicles—including decreased crashes, increased mobility and increases in fuel economy—will outweigh the likely disadvantages," said James Anderson, lead author of the study and a senior behavioral scientist at RAND, a nonprofit research organization.

The study, intended as a guide for state and federal policymakers, explores communications, regulatory challenges and liability issues raised by [autonomous vehicle](#) technology.

Anderson and his colleagues reviewed the current literature on the subject and conducted interviews with 30 stakeholders, including automobile manufacturers, technology companies, communications providers, representatives from state regulatory agencies and others. Researchers suggest that a guiding principle for policymaking is to encourage the technology when the facts indicate clear societal advantages over the capabilities of the average human driver.

Several states (Nevada, Florida, California, Minnesota) as well as Washington, D.C., have created laws to regulate the use of autonomous

[vehicle technology](#). Other states also have proposed legislation. Unfortunately, this could lead to a patchwork of conflicting regulatory requirements that vary from state to state, which could undermine potential benefits, Anderson said.

Cars and light vehicles equipped with this technology will likely reduce crashes, energy consumption and pollution, as well as cut costs associated with congestion. According to the Insurance Institute for Highway Safety, nearly a third of all crashes could be prevented if all vehicles had forward collision and lane-departure warning systems, side-view (blind spot) assistance and adaptive headlights. And as of March 2013, Google had logged more than 500,000 miles of autonomous driving on public roads with its driverless car without incurring a crash.

Autonomous vehicles have the potential to provide increased mobility for the elderly, the disabled and the blind. The costs associated with traffic congestion could be reduced because riders could do other tasks in transit.

Fully autonomous cars also could improve land use in several ways. Currently, about 31 percent of the space in the central business districts of 41 major cities is dedicated to parking, but autonomous vehicles would be able to drop passengers off, and then drive themselves to remote, satellite parking lots. The technology also might reduce car ownership and promote ride-sharing.

However, Anderson said that many of the benefits will accrue to parties other than the technology's purchasers. These positive societal effects may justify some form of government subsidy to encourage more consumers to use the new technology.

Negative consequences include the possibility that the technology may encourage greater travel and increase total vehicle miles traveled, leading

to more congestion. If autonomous vehicle software becomes standardized, a single flaw could lead to many accidents. Internet-connected systems might be hacked by the malicious.

Researchers say there also are a number of issues that car manufacturers and policymakers will have to work through before the widespread use of driverless vehicles becomes common. While technology can sense and react quicker than humans, it is not as good at interpreting data. For example, is that object in the road a deer, a cardboard box or a bicycle? Weather, terrain and roadway signage vary across the United States—will a vehicle be able to perform in a dry, flat climate as well as a snowy one with steep hills?

Car manufacturers also will have to deal with the issue of sensor failure, Anderson said. Designing a system that recognizes when a sensor is not transmitting any information is easier than developing one that can determine when a sensor is throwing out intermittent or nonsensical data. Developing the infrastructure to allow systems such as traffic signals to communicate with these cars also will be complex and potentially costly, and making sure the technology is secure from hackers is another concern. Finally, despite growing interest in autonomous vehicle technology, it may be too expensive for widespread adoption.

The study recommends the following policy considerations:

- Policymakers should avoid passing regulations prematurely while the technology is still evolving.
- Distracted-driving laws will need to be updated to incorporate autonomous vehicle technology.
- Policymakers should clarify who will own the data generated by this technology and how it will be used, and address privacy concerns.
- Regulations and liability rules should be designed by comparing

the performance of autonomous vehicles to that of average human drivers and the long-term benefits of the technology should be incorporated into determinations of liability

More information: "Autonomous Vehicle Technology: A Guide for Policymakers," www.rand.org

Provided by RAND Corporation

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