Introducing autonomous vehicles sooner could save hundreds of thousands of lives

November 7 2017

Credit: CC0 Public Domain

Autonomous vehicles should only have to be moderately better than human drivers before being widely used in the United States, an approach that could save thousands of lives annually even before the

technology is perfected, according to a new RAND Corporation report.

Allowing wide use of autonomous vehicles when they are just 10 percent better than current American drivers could prevent thousands of road fatalities over the next 15 years and possibly hundreds of thousands of fatalities over 30 years, researchers found, compared to waiting until they are 75 percent or 90 percent better.

Given the many uncertainties about the future of autonomous vehicle performance and use, the calculations were made by estimating road fatalities over time under hundreds of different plausible futures and different safety requirements for autonomous vehicle introduction.

"Our work suggests that it is sensible to allow autonomous vehicles on America's roads when they are judged to be just moderately safer than having a person behind the wheel," said Nidhi Kalra, co-author of the study and director of RAND's San Francisco office. "If we wait until these vehicles are nearly perfect, our research suggests the cost will be many thousands of needless vehicle crash deaths caused by human mistakes. It's the very definition of perfect being the enemy of good."

Developers of autonomous vehicles are testing the cars in cities such as San Francisco and Pittsburgh, while federal lawmakers are considering a variety of new regulations and updates to existing regulations to govern their deployment and encourage their use. But what remains unknown is how good the vehicles have to be before they are made available for use to all consumers.

The allure of driverless cars is based partly on convenience and partly on the potential to eliminate costly human errors, such as driving when drunk, tired or distracted. More than 90 percent of crashes involve such driver-related errors, according to the National Highway Traffic Safety Administration.

Researchers acknowledge that even if autonomous vehicles are proven safer than the average human driver, the vehicles would still cause crashes. They remain vulnerable to other hazards, such as inclement weather, complex traffic situations, and even cyber-attacks.

"This may not be acceptable because society may be less tolerant of mistakes made by machines than of mistakes made by people," said David Groves, study co-author and co-director of RAND's Water and Climate Resilience Center. "But if we can accept that early self-driving cars will make some mistakes—but fewer than human drivers—developers can use early deployment to more rapidly improve self-driving technology, even as their vehicles save lives."

Kalra hopes the study will enable policymakers and the public to better weigh potential risks and benefits of autonomous vehicles. Key considerations include how to measure the safety of the vehicles and what should constitute a passing grade.

The report builds upon past research that found road testing under real traffic conditions is impractical for proving autonomous vehicle safety prior to deployment because it would take decades or longer to drive the requisite miles.

There is no question that traffic accidents pose a public health crisis. Citing figures from the National Safety Council, the report notes that crashes caused more than 35,000 fatalities and 2.4 million injuries in 2015. The council projected 2016 would be deadlier, with 40,200 fatalities.

More information: "The Enemy of the Good: Estimating the Cost of Waiting for Nearly Perfect Autonomous Vehicles," www.rand.org/

Provided by RAND Corporation