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Paradigm shifts and improved safety – What Americans should expect from automated vehicles

Embracing emerging technology's impacts to our transportation networks, traffic safety and society as a whole

The epidemic of traffic fatalities in the U.S. numbers more than 35,000 each year. That's more than 35,000 friends, family members and loved ones who die in accidents and other traffic-related occurrences, according to the National Highway Traffic Safety Administration.

With the vast majority (over 90%) of accidents caused by human error, it is obvious why there is a keen interest by road operators and policy makers to address the issue. The mandate is plain and simple — we need bold and aggressive strategies to make our roads and highways safer.

As traffic technology moves forward, however, what should Americans expect? Is emerging technology truly safe, and how will it affect our lives?

To start, let's look at where the industry is headed.

Industry timeline
NHTSA has begun its formal rulemaking process for mandating connectivity in 100 percent of all new passenger cars by 2023 — a rule more than 15 years and $600 million in the making. NHTSA has also developed a draft policy for automated vehicles that lays the groundwork for safety and policy issues associated with these new vehicles.

The current focus is on self-driving cars that completely remove the need for human intervention, and thus the potential for human error. Given the amount of attention and resources being poured into these technologies, a consumer-grade, fully automated vehicle will likely be available for purchase within the next five years. However, due to cost and policy and regulatory issues, formal adoption of this may not take place for another five to ten years after these initial vehicles hit the market.

However, we are already seeing special use of fully automated vehicles by transit agencies, with other organizations expected to join in the coming years. Many of these will be eight- to 16-passenger shuttles that connect passengers on the first and last mile of transit systems, extending the reach of existing bus and rail service into neighborhoods.

These vehicles also support specific developments, such as airports, college campuses and Town Center-type developments. These deployments may also include smaller vehicles operating in an on-demand mode on mixed-use road facilities where some of the policy, regulatory and insurance issues can be more closely controlled than in the general consumer market.

Impacts to our transportation system
Once widespread adoption takes place, automated vehicles have the potential to significantly reduce lane widths on our freeways and roads — we may not need 12-foot-wide lanes if vehicles can track in perfect lines.

The increased efficiency of road pavement width could mean that a current two-lane roadway could be restriped to three, three lanes to four, and so on, increasing the number of lanes on a road without increasing the footprint of the road.

Similarly, the space between vehicles can be reduced, increasing lane capacity. Without a person behind the wheel, vehicles could operate safely at significantly higher

speeds. The overall impact? By using our existing road network more efficiently, we will simply need to maintain the network instead of constantly expanding it.

Other impacts, such as parking and vehicle miles traveled, are going to be a function of vehicle ownership, which is still uncertain territory. Many people think no one will own automated vehicles, but users will share rides and vehicles, sparking "Mobility as a Service" on a grand scale. In this scenario, there are minimal needs for parking garages in urban areas, higher vehicle occupancy rates and other potential benefits.

However, if vehicle ownership doesn't change because of automated vehicles, we have what the industry calls "zero occupant vehicles," meaning our cars will drive us to work and then drive home, waiting in our garages to be called into service and pick us up. Cars would potentially be doubling the number of trips, and miles, they were taking previously.

Impacts to jobs
Concerns have been voiced that truck, bus and taxi drivers are among the workers facing an uncertain future as automation comes to market. How can they be reintegrated into the workforce if they see their jobs eliminated?

To start, the transition to automation will not happen overnight, so we have time to prepare for the disruption automated vehicles will cause. Even if the technology were available today, it takes time and capital for fleets to turn over. As a result, some of the workforce issues will be mitigated by attrition — retirement or natural job transitions. As the prevalence of automated vehicles accelerates, however, we will ultimately need new training programs for those directly impacted.

In addition to drivers, the shift to a driverless and crash-less transportation system will also impact car repair shops and emergency rooms — both of which get cars and people back on the road. If there are fewer crashes, we may need fewer car repair shops and emergency room personnel, especially trauma personnel. While those in the medical field will always be in demand, mechanics and drivers may need retraining, and programs will need to be developed to support these activities. Even the insurance industry could be impacted, with less demand for car insurance claims inspectors and adjusters.

The primary goal of automated vehicles is to reduce crashes, thereby saving lives. Advances in technology always come with an impact on jobs — both positive and negative. While we need to be conscious of these impacts, we also need to focus on the ultimate goal.

Ensuring safety and trustworthiness
These connected- and automated-vehicle systems promise a myriad of benefits, including safety. However, there are still safety and operational kinks to be addressed.

One example is the tragic fatality of a Florida man in an automated vehicle in 2016. The loss of life is never acceptable, and this event seemed to shift the conversation in a way the industry hadn't seen over the past few years: a focus on the need for slightly better oversight of the technology and how it's both implemented by the manufacturer and used by the operator. One original equipment manufacturer even publicly declared the logic in their vehicles would be designed to save passengers in their vehicles above all else.

This commitment to safety is the kind of mindset the industry needs to have, and we need to ensure we include privacy, insurance and policy as part of technical discussions. Additionally, we need to be open about how we move from research and development to actual operations. If more automated vehicle developers are open about things like operations history, the industry builds public trust.

Embracing the change
As we approach this transportation revolution, it is important the public understands both the benefits of automated vehicles and the changes to American life they should expect. Our infrastructure will significantly change once widespread adoption takes place, with improved lane capacity and potentially more development space in urban areas. And while many of our nation's workers may anticipate displacement, the industry's gradual evolution affords opportunity for professional growth and new careers.

Most importantly, safety will continue to be the key industry driver. As these automated systems advance, we move toward our ultimate goal — zero traffic fatalities nationwide.

About the author
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