



## Autonomous Vehicle Guidelines Must Require Driver Behind the Wheel -- John M. Simpson, Privacy Project Director, April 27, 2016

Consumer Watchdog, a nonprofit, nonpartisan public interest group, agrees that some automated vehicle technologies, such as automatic emergency braking, will save lives. But those systems are designed to work with and augment a human driver's abilities and compensate for their shortcomings. However, we are deeply concerned that an unjustified rush to deploy self-driving robot car technology without the ability of a driver to take control when necessary will threaten the safety of the nation's highways.

The latest push came only yesterday with the announcement of the creation of a lobbying group called the Self-Driving Coalition for Safer Streets. It includes Alphabet Inc.'s Google, Lyft, Uber, Ford and Volvo. If these manufacturers genuinely cared about Safer Streets, rather than pushing self-serving laws and regulations, they would be transparent about what they're doing on our public roads. When something goes wrong, the technical details should be released to the public. It's not happening.

For example, a Google robot car crashed into a bus on Valentine's Day. Video recorded on the bus by the transit company was released to the public. Google says it has no plans to release its video or technical data about the incident. When public roads are used as private laboratories, there needs to be complete transparency. Google must release video of this crash, as well as all the other crashes involving its robot vehicles.

I've brought something with me today, because I think some promoters of self-driving robot cars like Google may have forgotten what it is. It's called a steering wheel. It remains an essential way for a human to intervene and take control of a self-driving robot car when something goes wrong.

Google wants to take the human driver completely out of its self-driving robot car. Perhaps that will be possible in decades, though it's not at all clear it can ever happen. Deploying a vehicle on public roads today without a steering wheel, brake, accelerator and a human driver capable of intervening when something goes wrong is not merely foolhardy. It is dangerous.

California's autonomous vehicle testing regulations require a steering wheel and a driver who can take over. Rules for the general deployment of self-driving vehicles recently proposed by the DMV continue this necessary safety provision. So should NHTSA's guidelines.

The need to require a driver behind the wheel is obvious after a review of the results from seven companies that have been testing self-driving cars in California since September 2014. Under California's self-driving car testing requirements, these companies had to file "disengagement reports" explaining when and why a test driver took control. The reports show that the cars are not always capable of "seeing" pedestrians and cyclists, traffic lights, low-hanging branches, or the proximity of parked cars, suggesting too great a risk of serious accidents involving pedestrians and other cars. The cars also are not capable of reacting to reckless behavior of others on the road quickly enough to avoid the consequences, the reports showed.

For example Google, which logged 424,331 “self-driving” miles over the 15-month reporting period, said a human driver took over 341 times, an average of 22.7 times a month. The robot car technology failed 272 times and ceded control to the human driver; the driver felt compelled to intervene and take control 69 times.

Other testing companies, driving far fewer autonomous miles than Google, also reported substantial numbers of disengagements. Bosch had 625 disengagements with 934.4 miles driven. Nissan with 1,485 miles driven had 106. Mercedes-Benz reported 1,031 with 1,738 miles driven. Delphi reported 405 disengagements with 16,662 miles. Volkswagen with 10,416 miles reported 260. Tesla claimed it had none, but did not say how many miles its drove.

It’s important to understand that these “disengagements” were prompted by real situations that drivers routinely encounter on the road. Among reasons cited by Bosch were failures to detect traffic lights and heavy pedestrian traffic.

Google’s robot technology quit 13 times because it couldn’t handle the weather conditions.

Twenty-three times the driver took control because of reckless behavior by another driver, cyclist or pedestrian. The report said the robot car technology disengaged for a “perception discrepancy” 119 times. Google defines such a discrepancy as occurring when the car’s sensors don’t correctly perceive an object, for instance over-hanging branches. The robot technology was disengaged 55 times for “an unwanted maneuver of the vehicle.” An example would be

coming too close to a parked car. The human took over from Google's robot car three times because of road construction.

What the disengagement reports show is that there are many everyday routine traffic situations with which the self-driving robot cars simply can't cope. It's imperative that a human be behind the wheel capable of taking control when necessary.

Proponents of removing the ability of the driver to take control argue that the robot technology will lull the occupant into a distracted state where they cannot intervene effectively. But it's clear the current robot technology cannot reliably handle a number of routine situations and the driver must be able to take control. The emphasis should be on developing warning systems to give the driver ample time to intervene.

If there were only robot cars on the road that could communicate with each other the problems might be simpler to solve. That is not the reality. Drivers sometimes communicate with each other with gestures. Traffic cops use hand signals to give directions. Drivers often communicate with pedestrians in such places as shopping center parking lots with hand signals. How can a self-driving robot car deal with such situations? It cannot.

Here is another issue that self-driving car manufacturers must face. Their programmers will be making life and death decisions in the algorithms they create to navigate the vehicle. What ethical choices will these humans program into the robot car? Will the vehicle protect the safety of its occupants over the safety of pedestrians and cyclists? These are serious moral issues and

there must be complete transparency from the developers of self-driving robot car technologies about the choices their programmers are making.

Here is another key safety requirement: As the National Highway Traffic Safety Administration reviews the safety claims of the developers of self-driving robot car technology, you must not rely only on the word of the manufacturers. Manufacturers have a vested interest in rushing to make their product available as soon as possible. Tests of this complex robot technology by an independent third-party organization will help ensure the self-driving vehicles can perform as claimed and can handle situations encountered in the real world.

When I spoke in Washington I listed 10 questions I said NHTSA should ask Google about its self-driving car program. Today I'll give Google's representatives those questions and ask that they answer them soon.

You have repeatedly said safety is the agency's top priority. You must not allow your judgment to be swayed by rosy, self-serving statements from companies like Google about the capabilities of their self-driving robot cars. NHTSA has said that autonomous vehicle technology is an area of rapid change that requires you to remain "flexible and adaptable." Please ensure that flexibility does not cause you to lose sight of the need to put safety first. Innovation will thrive hand-in-hand with thoughtful, deliberate regulation. Your guidance for the states on autonomous vehicles must continue to require a human driver who can intervene with a steering wheel, brake and accelerator when necessary.

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