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The Good and Bad News on Uber's Fatal Crash

By Chuck Dinerstein, MD, MBA — May 25, 2018

Courtesy of Wikipedia [1]

The National Transportation Safety Board (NTSB) released their preliminary [2]report on the fatal crash of an autonomous Uber car and pedestrian in Arizona yesterday. Because it is a preliminary report, no probable cause has been officially identified. Here are the takeaways:

- The pedestrian was wearing dark clothes, walking a bicycle with reflectors perpendicular to the car's path and therefore not seen. She was crossing in an area not directly illuminated by the roadway lighting that was functioning and present. She looked at the vehicle just before impact and toxicology reports found methamphetamine and marijuana.
- The driver, another woman, was on the second loop of a test route and the car had been under computer controlled for 39 minutes. The cameras recorded her looking at the center of the vehicle, the site of computer monitoring interface, on several occasions. Less than a second before impact she engaged the steering wheel disabling the computer and applied brakes less than a second after impact. She had two cell phones in the care which she did not use until calling 911 for assistance after the crash.
- The road consisted of four lanes, the car was in the rightmost lane, next to the bicycle lane. There is a center median with signs warning pedestrians to use the crosswalk, located 360 feet from the accident. The car was driving at 43 mph, less than the posted 45 mph limit.
- The car had ten cameras in addition to radar, LIDAR [1], navigation sensors and an integrated computer and data storage unit. The autonomous driving system in enabled, engaged and disabled much as we would initiate cruise control. Because the Volvo has its own collision avoidance system, including emergency braking, the car would act erratically when receiving instructions from both the autonomous driving and Volvo's systems. Volvo's

collision avoidance system was disabled to eliminate conflicting signals when the computer was engaged. The system does not automatically alert the operator who is expected to remain vigilant and intercede as necessary.

- Traveling at 43 miles per hour is roughly 63 feet per second. The pedestrian was identified 380 feet (6 seconds) before impact and emergency braking to mitigate the crash was determined 283 feet (4.5) seconds later. That would have left 94 feet to come to a stop. (For comparison, the typical reaction time is 1.5 seconds, and braking distance varies with car weight and speed but would be roughly 80 feet)

So there are a few things we can say at this point. The system did identify an obstacle and was prepared to take timely, appropriate action, but this function was disabled. As I have suggested before, these are not genuinely autonomous systems; you are not going to get in the car and take a nap or read a book, you will have to monitor and provide oversight for the computer systems – just like pilots do in planes. Most importantly, there is a great deal of data about the accident that can be used to prevent future accidents and this is a big step forward. The National Transportation and Safety Board is a beautiful example of how our government should work, they are objective and are willing to let the “chips fall where they may” irrespective of who is involved.

[1] LIDAR is an acronym for Light Detection and Ranging that uses infra-red light to gauge distance.
