

21 september 2016

Hands off: A vision of the future as driverless cars take to Flanders' roads



by Denzil Walton,

Summary

A fleet of driverless cars hit the road this month, as the developing technology was put to the test in real-life situations

Reinventing the wheels

There's something counter-intuitive about self-driving cars. Drivers are repeatedly being told to remain vigilant while at the wheel and avoid any kind of distraction that might take their eyes off the road ahead, even for a few seconds. Yet a self-driving car seems to encourage drivers to take not only their eyes off the road, but their hands off the steering wheel.



Promotional videos of the potential of self-driving cars frequently show a person sitting in the “driver’s” seat reading a book, writing emails on their smartphone or watching a video. This is why the self-driving car is such a huge revolution. It’s something so radically different, so out-of-the-box, that it demands a totally new way of thinking.

But are we ready for it?

To understand self-driving cars, it’s first necessary to separate the future vision from the present-day reality. In the future vision, self-driving cars cruise along our roads, keep to the speed limits, maintain a safe distance from the vehicle in front, stop at traffic lights, steer around unforeseen obstacles, slam on the brakes when a child runs from behind an ice-cream van and perform almost every other activity involved in safe driving.

Quick reactions

It’s a vision in which you as the “driver” will be able to make the most of your commute to work by catching up on emails or phone calls, or simply chilling out. Whatever you do, you’ll arrive at work feeling more relaxed than if you’d been battling the commuter traffic by yourself.

It’s also a vision that extends into your leisure time. You’ll be able to jump out of your car outside a shopping centre or restaurant, while the car takes itself off to find a space in the nearest car park. After your shopping spree or meal, you’ll simply signal to the car to pick you up and drive you safely home.

You’ll be able to jump out at a restaurant, while the car takes itself off to find a space in the nearest car park

The current reality is somewhat different. This is because fulfilling the vision involves the incremental addition of functionalities to a car to make it increasingly autonomous. Some of these systems are already in use today.

One is adaptive cruise control, which automatically adjusts the vehicle’s speed on the motorway to maintain a safe distance from those ahead. Another is a parking assistance system, which can reduce or eliminate the back-and-forth of parking.

Other systems are less familiar but will be vital for a fully autonomous car. The lane assist system keeps the vehicle in the middle of a detected lane. The goal of the predictive emergency braking system is to reduce the risk of a rear-end collision by reacting more quickly than a human can.

Traffic jam assistance is an evolution of adaptive cruise control for use in dense stop-and-go traffic, while traffic light recognition technology enables cars to detect how long before a red light turns green. On top of all these systems, a self-driving car will be fitted out with a whole range of sensors, lasers and cameras which it uses to “see” its surroundings.

Fatal consequences

But why do we need self-driving cars? What’s wrong with things the way they are? The answer lies in the fact that 93% of all traffic accidents are caused by human error.

A miscalculation of distance. Pressing the wrong pedal. Forgetting to look. Getting angry. Driving while tired. Changing a CD. Using a smartphone. Texting. Driving while under the influence. The list is, unfortunately, more or less endless.

And the results are too frequently fatal. Throughout the world, nearly 1.3 million people die in road crashes each year; an average of more than 3,000 deaths a day, with an additional 20-50 million people injured or disabled. In 2014, 727 people died in road traffic accidents in Belgium. That's an average of two a day.

*Computers are better drivers than humans.
They don't drink, they follow the rules, and
they're not distracted*

- MOBILITY MINISTER BEN WEYTS

So could human error be taken out of the equation? Flemish mobility minister Ben Weyts certainly believes so. "If we actually want to do something about the 400 road deaths every year in Flanders, this could be the solution," he says. "Computers are better drivers than humans. They don't drink, they follow the rules, and they're not distracted."

Earlier this month, at the headquarters of insurance broker and risk management specialist Aon Belgium, 30 semi-autonomous cars were put to the test: models from Audi, BMW, Lexus, Mazda, Mercedes, Tesla, Toyota, Volkswagen and Volvo. They had all been fitted with adaptive cruise control, the lane-keeping assist system and a predictive emergency braking system.

After a safety briefing, the platoon was divided into six convoys and headed off on a 35-kilometre trip from Diegem to Bornem (and back), via the Brussels Ring, the A12 and the N16. I was behind the wheel of a VW *Touareg*.

Adaptive cruise control was set to 120kmh, and we settled behind the car ahead. As we approached a bend, I wondered whether to turn the steering wheel myself to stay in lane. It wasn't necessary. The car automatically made frequent small adjustments to stay perfectly in the centre of the lane and safely navigate the bend.

A car overtook and pulled up right in front, but the vehicle quickly and smoothly braked, throttled back to maintain the correct distance, and then sped up when the road ahead was clear.

The first time is always scary

On the A12 we met our first traffic light. It was green, and I was hoping it would remain so. It didn't. The cars ahead of me decelerated. Mine didn't.

Brake lights appeared. The *Touareg* began to decelerate, but I wasn't convinced it had given itself sufficient time to stop. My foot nervously hovered over the brake pedal. But just as I was about to apply the brakes, the car slowed down and came to a smooth stop behind the car in front.

"The first time is always a little scary," said the VW representative in the passenger seat. "This is because the car calculates the optimum stopping distance and deceleration speed, based on the action of the car ahead. You were looking further ahead at what the traffic lights were showing, so you were anticipating having to stop before the car was."

*There will not be a self-driving car until a
good insurance policy adapted to this type of
vehicle is available*

- AL PIJNACKER, AON BELGIUM

The second set of traffic lights was less traumatic, and by the third set, I had gained complete trust in the car and was even beginning to relax.

The ride wasn't without its problems, though. I had to take back manual control at the very busy A12-Ring intersection. I also had to override the car on a sharp exit bend when a strong hand was required on the wheel.

Overall, I was impressed by the technology on display, and generally felt safe. At the same time, I understand people's reservations, particularly with a semi-autonomous car when the driver has to decide when to let the car do the steering and when to take over control.

It's an issue that Al Pijnacker, director automotive at Aon Belgium, is well aware of. "People don't yet have full confidence in the new technology," he says. "It's like the automatic elevator."

Legal issues

The first elevators were operated by an elevator boy or liftman, he points out, and when automatic elevators were introduced, people were wary of taking one on their own. "It took time for them to feel confident with the new technology. It's the same today with self-driving cars. But I'm convinced that people will come to trust and enjoy them."

Plenty of obstacles still lie ahead, such as legal and liability issues. In the event of something going wrong with a self-driving car, who is liable? The manufacturer, software provider, dealer, fleet owner, driver?

"Maybe we need something like an aircraft's black box to find out what went wrong," Pijnacker suggests. "What's certain is that there will not be a self-driving car until a good insurance policy adapted to this type of vehicle is available."

A lot of fine-tuning is certainly necessary, but that's always the case with new technology. Part of the reason for the platoon test was to gain more data, particularly on how drivers would react behind the wheel of a semi-autonomous vehicle on a busy Flemish motorway. This data will be analysed, and improvements implemented