

The Traffic Light turns 100

100 years ago, on August 5, 1914, the first electric traffic light was installed on a city street in Cleveland, Ohio, marking a milestone in traffic management. Today the red-yellow-green signals are an integral part of city landscapes worldwide, likely saving hundreds of thousands of lives each year. Traffic lights have become more intelligent over the years: modern traffic management takes into account the current traffic situation and optimizes traffic flow, for example, by allowing "green waves" or by prioritizing emergency vehicles, buses, and trams. And the success story of traffic lights continues – in this interview Wilke Reints, Head of Development Intelligent Traffic Systems at Siemens AG, tells us what the future of traffic lights will look like and whether there will still be a need for the red-yellow-green signals in the future.

What will the traffic light look like in 20 years?

WR: Even if groundbreaking changes have taken place inside a traffic light – on the outside, little has changed over the last 80 years. Nor is it likely to change much in the near future, as we are so used to what a traffic light already looks like. Some of the changes we can expect are that the signal generator will become smaller, flatter and significantly more energy-efficient. It can also easily be imagined that the traffic light becomes more technologically advanced, providing further information, for example on how long the signal will stay red or green.

In the future, will there even be a need for traffic lights?

WR: I can think of two scenarios: One is that driverless vehicles will quickly develop further and will be the only ones permitted on our roads. That would mean a "virtualization" of the traffic light, as the driver would presumably no longer need to see a traffic signal. Traffic lights would then only be necessary for pedestrians, cyclists and motorcycles.

More likely, from my point of view, is the second scenario in which driverless vehicles will be introduced gradually and will share the roads with manually driven vehicles over the next 20 years. Obviously, this means we would maintain our traffic lights for quite a while longer.

Will roundabouts make traffic lights obsolete?

WR: Roundabouts are a great invention but have one significant flaw: they cannot handle large traffic volumes. As soon as there is a lot of traffic it causes a traffic jam resulting in a standstill in all directions. For that reason, roundabouts only make sense in areas where traffic stays below the capacity limit of surrounding streets. Roundabouts can also be problematic for other reasons: they require much more space than traffic lights, they cannot handle intersections with a heavy traffic flow from only one direction, and they cannot deal with emergency issues.

Will all road users communicate with traffic lights in the future?

WR: I am sure they will – the communication technology between vehicle and infrastructure already exists and can do amazing things. Soon, our smart phone could let us know at what speed to drive to hit a sequence of green lights, or could request a green light at an intersection ahead. Also, the traffic light could warn individual road users of possible hazards. It will increasingly become a partner for drivers: Imagine a friendly voice saying: “Get ready, the traffic light will turn green.” This way, we can perfectly time when to put the car in gear and release the clutch – and the journey continues.

In your opinion: What has been the most significant breakthrough in the area of traffic lights over the past 100 years?

WR: The most important breakthrough has, without a doubt, been the introduction of micro-processor technology. Today optical signalling systems are small wonders, evaluating unlimited amounts of signals in real time. Today’s traffic light is like a smart phone in the case of a C-64-computer. But to facilitate a city’s traffic flow in the best possible way requires a “brain” – a traffic computer that, for example, automatically switches lights to green at the right time.

What is the next big innovation that we can expect?

WR: The next big innovation will be interconnected communication between people, infrastructure and vehicles of all kinds. The objective: To guide every road user to

his or her destination in the best and fastest way. If there is a traffic jam in the city center, my smart phone would recommend using the train instead of the car. Traffic management will also be tailored more precisely to individual road users – without forgetting the big picture. And the traffic light will not only take an active role in this communication, it will be one of the most important parts. What does that mean? This means that traffic lights will not only turn from green to yellow to red but also react according to what is happening in its environment.

What is the yellow phase of the traffic light for?

WR: Traffic-wise, a green light turning yellow gives a driver time to decide whether to go on or to stop. Driving through a yellow light is actually only allowed if it is no longer possible to safely bring the vehicle to a stop. The yellow phase also includes time for the driver to react, to decide whether to stop or not.

And a red light turning yellow– well, I learned in my driving lessons that this is the time to put the car in gear.

Contact for journalists:

Stefan Wagner, Phone: +49 (89) 636-632041

E-mail: sw.wagner@siemens.com

Press pictures are available at: www.siemens.com/press/traffilight100

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