The Myth of 5G and Driverless Cars

By Doug Dawson

A colleague sent me an article that had been published earlier this year in *MachineDesign* magazine that predicts that driverless cars can't be realized until we have a ubiquitous 5G network. When looking for the original article on the web I noticed numerous similar articles like this one in *Forbes* that have the same opinion.

These articles and other similar articles predict that high-bandwidth, low-latency 5G networks are only a few years away. I'm not quite sure who these folks think will invest the $100 billion or more that would likely be required to build such a wireless network along all of the roads in the country. None of the cellular carriers have such grandiose plans, and if they did, their

stockholders would likely replace a management team that suggested such an investment.

It's easy to understand how this myth got started. When 5G was first discussed, the cellular companies listed self-driving cars as one of the reasons the government should support 5G. However, over time, they've all dropped this application from their 5G message, and it's no longer a cellular company talking point.

The idea that 5G is needed for self-driving cars is bolstered by the belief that the computing power of a data center is needed to process the massive amounts of data generated by a self-driving car. That very well may be true, and the current versions of self-driving cars are essentially data centers on wheels that contain several fast computers.

The belief that 5G will enable self-driving cars also comes from the promise of low latency, near to that of a direct fiber connection. The folks that wrote these articles envision a massive 2-way data transfer constantly happening with 5G for every self-driving car. I can't imagine they have ever talked to a network engineer about the challenge of creating 2-way wireless gigabit connections with hundreds of moving cars simultaneously on a freeway at rush hour. It's hard to envision the small cell site and fiber infrastructure needed to handle that without hiccups. I also don't know if the authors have recently driven down many rural reads recently to remind themselves of the huge challenge of implementing rural gigabit 5G.

The talk of using wireless for vehicles also ignores some fundamental issues. Wireless technologies are wonky in the real world. Radio waves do odd things in the wild, and every wireless network has dead zones and places where the system mysteriously won't work the way it's supposed to. Worse, the dead spots and odd spots move around with changes in temperature, humidity, and precipitation.

Network engineers also would advise that for a critical task like driving at high speeds that every vehicle should have a redundant back-up connection, meaning a second wireless connection in case the first one has a problem. Anybody that puts critical tasks on a fiber network invests in such redundancy. Hospitals that use broadband as part of a surgical procedure or a factory that does precision manufacturing will have a second fiber connection to be safe. It's hard to imagine a redundant connection for a moving car since the only place it can come from is the nearest cell sites that provide the primary connection.

I don't know how others feel about this, but I'm not about to trust my life to a self-driving car that needs a connection to an external data center to be safe. I know too much about how broadband networks function to believe that 5G networks will somehow always make perfect connections when other fiber networks don't.

One of the first things that came to my mind when I read these articles was to wonder what happens when there is a fiber outage on the network supporting the 5G cell sites. Do all of the self-driving cars just stop and wait for a broadband signal? I picture a city during an event like the 19-hour CenturyLink fiber outage a year ago and wonder if we are so stupid as to make our transportation systems reliant on external computing and external networks. I sure hope that we are not that dumb.