*KEEP IT SIMPLE, SILLY —*

# Another company is dialing back expectations for self-driving taxis

The key question about self-driving is which applications will be viable first.

TIMOTHY B. LEE - 11/14/2019, 4:45 PM



*Christoph Schmidt/picture alliance via Getty Images*

/ Ola Källenius of Daimler AG.

Daimler is planning to "rightsize" its spending on self-driving taxis, Chairman Ola Källenius said on Thursday. Getting self-driving cars to operate safely in complex urban environments has proved more challenging than people expected a few years ago, he admitted.

"There has been a reality check setting in here," Källenius said, according to Reuters.

He is just the latest executive to acknowledge that work on self-driving taxi technology is not progressing as fast as optimists expected two or three years ago. Earlier this year, Ford CEO Jim Hackett sought to dampen expectations for Ford's own self-driving vehicles. Industry leaders Waymo and GM's Cruise missed self-imposed deadlines to launch driverless commercial taxi services in 2018 and 2019, respectively.

There has been a lot of focus over the years on asking when self-driving cars will become a reality. But a better question to ask is: which applications of self-driving technology will be viable first?

# Many roads to self-driving

Experts have long known that it won't be feasible to go directly to market with a vehicle that can drive itself everywhere, in all weather and traffic conditions—something referred to in the industry as "level 5 automation." Rather, companies have tried to start with narrower, less-demanding use cases that could be technologically and economically viable long before full level 5 autonomy is ready.

Different companies are pursuing different strategies:

- **Tesla** is betting that it can gradually upgrade its driver-assistance technologies—first Autopilot and now Smart Summon—until they become fully autonomous driving technologies.

- Companies like **Waymo** and **Cruise** are seeking to develop taxi services that are geographically limited to a single metropolitan area. Waymo chose suburban Phoenix because its sunny weather, wide streets, and predictable grid make it a relatively easy environment for software to understand.

- Other startups are pursuing taxi or shuttle services in much more restricted areas. A startup called **Voyage** is building a taxi service for one of the nation's largest retirement communities. Another, **Optimus Ride**, gets paid by real estate developers to ferry passengers around large planned communities.

- Some startups, including **Nuro**, are focusing on package delivery. This is an appealing first use case for self-driving technology because there's no need to worry about the comfort or safety of people inside the vehicle, allowing engineers to focus on the safety of people outside the vehicle.

- A number of startups, including **Ike**, **Embark**, **Starsky Robotics**, and **TuSimple** see long-haul trucking as the lowest-hanging fruit. They're working to develop technologies that will allow a truck to drive itself on freeways. They have different strategies for navigating the "last mile" of city streets. Some envision using remote-teleoperation by human drivers. Others envision

transferring a trailer from a self-driving truck to a human-driven one for the final few miles of each delivery.

The disappointments of the last couple of years suggest that the most ambitious projects on this list may be biting off more than any company can chew. Tesla's self-driving progress has been much slower than CEO Elon Musk predicted three years ago. Waymo and Cruise have found that it's quite difficult to develop a metro-wide driverless taxi service—even if you have the vast resources of Alphabet or GM at your disposal.

# The power of starting simple

In the last year, I've become more bullish about companies that are pursuing the simplest initial markets—particularly delivery startups like Nuro and small-scale taxi services like Voyage and Optimus Ride.

A big advantage all these companies enjoy is that their cars never need to go faster than 25 miles per hour. That means shorter stopping distances that reduce the risk of a crash. And it means a much lower chance that someone will die if one of the cars were to hit something. That means they may be able to bring their products to market more quickly than bigger companies pursuing more complex and challenging applications.

Once one of these companies has a commercially viable, fully driverless service, gradually expanding its service territory should be fairly straightforward. A company learns a lot from running a real service with real customers. And once you have a large fleet of cars doing real work, it's easy to collect additional sensor data to use in the next iteration of your technology.

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But larger companies also seem to be making progress. Waymo has recently started testing fully driverless rides with ordinary passengers. However, these driverless rides are currently limited to Waymo's closed Early Rider Program. It's not clear how close Waymo is to being able to do this on a commercial scale.

Cruise seems to be far from able to launch a commercial service—particularly because its home base of San Francisco is one of the most challenging driving environments in the United States.

Tesla continues to insist that it's making steady progress toward full autonomy, even as evidence of this progress is a bit hard to see from the outside. Tesla released its parking lot self-driving technology, Smart Summon, in September. Early customer reviews indicate that the technology still needs a fair amount of work, and of course driving safely in a parking lot at 5mph is an easier problem than driving safely through a multi-lane intersection at 55mph.

In his Thursday remarks, Daimler's Källenius signaled pessimism about driverless taxis but was more bullish on long-haul driverless freight delivery. But I'm

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skeptical that the long-haul trucking market will prove easier to tackle. Freeway driving is an easier problem than urban driving in some respects—there are clearly marked lanes and many fewer unpredictable (and vulnerable) obstacles like pedestrians and bicycles.

The problem is that if a driverless truck malfunctions on a busy freeway, the consequences could be catastrophic. It's not obvious how a company can test freeway truck driving software throughly enough to be sure it's safe enough to start doing fully driverless trips at freeway speeds.

**Correction:** I originally stated that Waymo isn't yet charging for driverless rides, but they tell me that's no longer true.

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200          300

100                                400

0k electric vehicles

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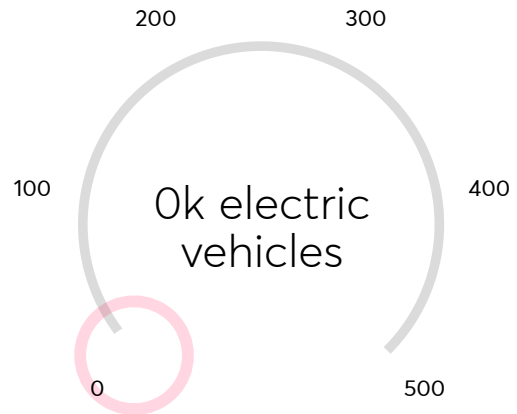
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