

SPECIAL REPORT BY NICK GIBBS

Why it might be time for optimism on self driving

WE'RE IN A slump right now when it comes to industry and consumer expectations of autonomous driving. That's the verdict of Kyle Vogt, head of the General Motors-backed autonomous driving company Cruise. "There's this pendulum that swings back and forth between extreme optimism and extreme pessimism. And I think we're more on the extreme pessimism side right now," he told investors at a recent conference.

Burned by the days of extreme optimism – for example, in 2020, Elon Musk claimed his company Tesla would have "one million robotaxis by the end of the year" – we are all understandably cautious when car companies promise imminent full autonomy. But Vogt says our pessimism is also now an illusion. "I think people are going to be caught off-guard by how quickly AVs [autonomous vehicles] go from the first ride that you've taken to available pretty much everywhere," he said.

Cruise is spending big – half a billion dollars between April and June alone – to roll out robotaxis, initially in the US. Cruise already offers limited driverless taxi rides in San Francisco and will add Austin and Phoenix by the end of the year. By 2025, says Vogt, Cruise will be selling autonomous cars to private customers and turning over a billion US dollars a year.

Is that another over-promised autonomous deadline that's going to whizz past us, drivers waving glumly from behind the still very present steering wheel? It's hard to say, but from our standpoint and those of the more hard-headed analysts, autonomy is slowly emerging from what analyst firm Gartner calls the "trough of disillusionment" up onto the "slope of



Cruise is testing purpose-built Origin Shuttle

enlightenment".

So what will that path look like? There will be three main routes to full autonomy. One is being taken by the likes of Cruise and will involve initially the lucky few hailing robotaxis in select, weather-friendly cities mostly in the US and China. This group includes Waymo and Argo AI in the US and, in China, Baidu (which secured

the country's first driverless taxi licence back in August), AutoX and Deeproute.ai. Expect Apple when it finally launches a car to join this side of the industry and build robotaxis.

The second route harnesses the ever-growing powers of advanced driving systems, the ones that are becoming increasingly common on everyday cars. The same tech that nudges errant drivers back in the lane or keeps cars a set distance in front is being beefed up to reach level three, where drivers can take their hands off the wheel but must be prepared to take back control.

This has been rolled out in a limited programme by Honda in Japan and in Europe by Mercedes with the new S-Class and EQS. Mercedes' so-called Drive Pilot takes over at speeds below 37mph on

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motorways and costs from €5000 (£4450) on the S-Class and €7430 (£6600) on the EQS. Mercedes is starting to ship cars with the system now in Germany, the first country to approve the system. The UK has also said it will allow cars with level-three ALKS (automatic lane keeping systems), although has banned drivers from focusing on anything other than the car's in-dash screen. No system has been given UK type approval yet.

The steep cost of specifying Mercedes' Drive Pilot is due to the extra tech needed (see box). For a lot less (unless you're a Tesla owner), drivers in the US and China can specify something that's semi-officially called level two-plus, which is hands off, eyes on. That means the driver still has to pay attention to the road ahead but can take their hands off the wheel. Level two-plus is essentially what Tesla operates under in the US, but has the cheek to call it FSD, for full self-driving.

However, Ford's BlueCruise and General Motors' rival Super Cruise have more safety systems in place, including an eye tracker making sure you're paying attention and a limit to the types of road you can use it on.

Ford, for example, claims that 65,000 drivers are using BlueCruise in the US, with 15,000 receiving it through over-the-air updates.

Ford charges \$600 (£555) for a three-year subscription to BlueCruise in the US, and we can expect similar here when – or if – it's allowed in Europe. BMW has also promised 'address-to-address' level two-plus capability on 'Neue Klasse' electric vehicles from 2025.

The third route to autonomy, meanwhile, lies in unmanned, low-speed applications, either confined to non-public areas such as ports, factories or depots, or small enough that they pose no specific danger to road users or pedestrians. These include the Starship delivery robots in use in Milton Keynes and Northampton, the Estonian capital Tallinn and a handful of US university campuses. The company claimed to have made three million autonomous deliveries up to February this year.

The stumbling block for autonomous cars remains the last 5% or so of non-predictable events that threaten to scupper

the reputation of self-driving accuracy with one fatal mistake.

One way to tackle these 'edge' cases is the approach China is taking to invest in road infrastructure that helps out the car by providing access to information from fixed cameras or lidar sensors – for example, on tricky junctions or in wet weather.

That's happening right now in China, a country that plans to invest \$300 billion (£277bn) between now and 2040 on what's described as 'vehicle infrastructure cooperation', the research



arm of UBS bank forecast in a recent report.

"Vehicle infrastructure cooperation should drive faster autonomous implementation as it removes vehicle-side technological bottlenecks," said the report.

The idea initially would be to create autonomous-ready highways that provide enough support to help guide first trucks and then eventually cars.

On those highways with the maximum level of autonomous guidance, China is planning to install, per kilometre, 50 cameras, 20 lidars, 20 millimetre-wave radars, 10 intelligent roadside units (with mobile connectivity) and four oxygen sensors, predicts UBS, with the aim of commercial adoption from around 2026.

Once driverless trucks are viable, even if depot-to-depot rather than door-to-door, then haulage companies will be prepared to pay the road charges needed to claw back some of the state investment needed, given the savings on driver wages (roughly a quarter of truck logistics costs).

We might not need outside help, even from the latest high-definition maps, Vogt said at the September conference. "We've cracked the code on that and eliminated the need for maps that are perfectly up to date," he said, claiming Cruise's cars can now handle a new traffic light not included in its on-board mapping.

What we do need to be mindful of, however, is that companies that exist purely to roll out fully autonomous software or vehicles are funded entirely by those who buy into the dream that autonomy will unlock gushing new revenue streams. As such, they need to keep the dream alive and the optimism flowing.

The routes that already are generating revenue, over and above a handful of daily robotaxi rides in sunny west coast US cities, could show a clearer path. So in fact it's probably Mercedes' level-three Drive Pilot, with its myriad sensors but hamstrung in red tape doled out by wary legislators, that probably gives a better view of the long grind ahead.

AV TECH REMAINS A COSTLY ADD-ON FOR TODAY'S CARS



Mercedes Drive Pilot programme 'takes the wheel' under 37mph on motorways

Why is Mercedes' Drive Pilot system so expensive? Because it needs a lidar sensor and redundancy built into the steering, braking and electrical systems in case of failure.

It then needs a camera in the rear window and microphones to listen out for sirens. It also comes with a water sensor in a wheel arch to check for rain (at which point it hands back to the driver). There's a more powerful GPS system, too. For the moment, this remains a technology for the rich.