Executive Summary

Autonomous vehicles have been imagined for many years, but early concepts relied on a massively expensive road infrastructure to supply the guidance data that is available via the relatively recent introduction of satellite navigation systems. With the advent of a more accurate global positioning system (GPS) navigation, as well as on--board sensors and associated with the advanced driver assistance systems (ADAS), cars now have the potential to drive themselves. However, several barriers remain before fully autonomous vehicles can be made available to the public.

All major car manufacturers are active in race to reach autonomous vehicles, with new partnerships continuously being announced. Most automakers are racing to differentiate their premium models with intelligent driver-assist functions, such as smart cruise control, accident avoidance, crash monitoring and reporting. Some manufacturers are going even further; for example, Volvo, the automaker known for safety focus, although relatively small in terms of global sales, predicts that it will be able to eliminate crashes altogether for anyone driving one of its cars by 2020.

In addition to traditional players, new automakers competitors are gaining traction in the autonomous vehicle race. Uber, despite recent challenges, has been testing autonomous vehicles in California. Waymo – Alphabet's self driving company – has completed millions of miles of testing. Tesla has been increasingly adding autonomous features into their cars in every software update.

Despite this high level of interest and investment, widespread adoption of completely autonomous vehicles is not expected to take place before 2030. Part of the challenge is related to regulation, with regulators likely demanding a large amount of statistical data to justify increased safety. Additional challenges include the need for mo-dern infrastructure that sensors can reliably read, security concerns, including cybersecurity, and, of course, the cost implications.

Furthermore, the expectation is that autonomous vehicles will initially be introduced in closed ecosystems, such as city centers or dedicated highway lanes, and integration with "traditional" vehicles will occur only when safety has been thoroughly demonstrated.

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