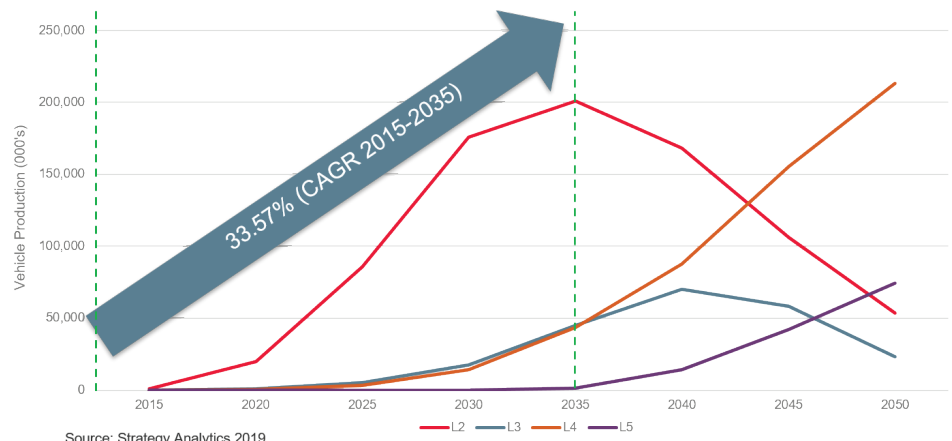


# THE SOFTWARE-DEFINED VEHICLE IS HERE — IS YOUR NETWORK BANDWIDTH READY?

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The concept of the “software-defined vehicle” is gaining momentum throughout the automotive industry. The way in which drivers and passengers will experience the car of the future is dependent on the software and related services offered by the car manufacturer. This will impact dramatically the architecture of the car as well as the bandwidth of in-vehicle networks (IVNs), which will continue to grow exponentially, as will the complications associated with high data rates.

The automotive industry is projected to see an estimated 33.57% compound annual growth rate (CAGR)<sup>1</sup> (2015-2035) of Level 2-5 ADAS technologies. Both current and future adaptive and automated applications will contribute to this rise with an estimated 7.89% CAGR<sup>1</sup> (2017-2026) and will influence IVN communication designs. For example, IVN designers will face <10ms deterministic latency requirements and the need to mitigate increases in the volume of “jitter” or interfering data that can significantly affect the data delivery required per the classification or priority to support the application’s intent.



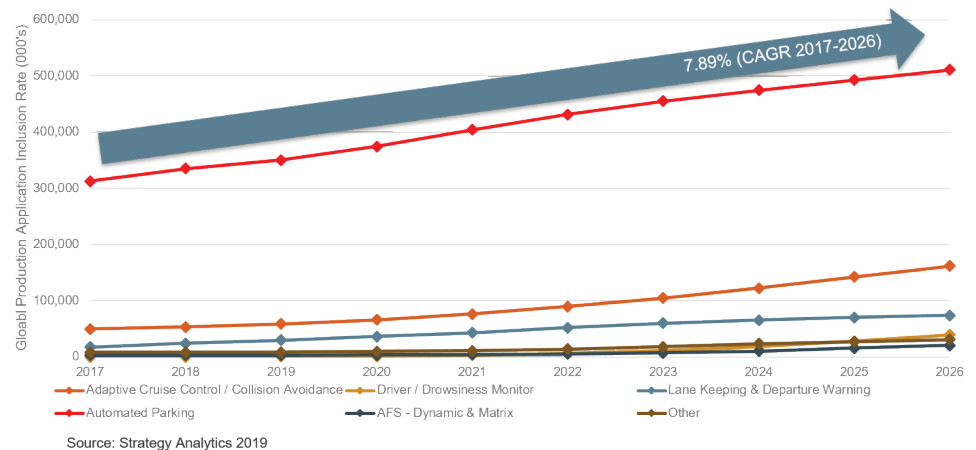
Compound Annual Growth Rate of Level 2-5 ADAS Technologies

Additionally, designers will need to consider the volume and frequency increase of data that the IVN has to accommodate due to 802.11p/DSRC V2V (dedicated short-range communication vehicle-to-vehicle) implementation requirements mandated by the National Highway Traffic Safety Administration by 2023, along with other network or access enablers. Some of these include 5G LTE/C-V2X, high-resolution cameras running at 60fps and frequency modulation continuous wave (FMCW) LiDARs with increasingly high and accurate scanning rates.





Fortunately, IVNs are projected to see a 40% increase in the implementation of automotive-grade, Ethernet-based communication standards. Future hardware and software tools like the IEEE 802.3ch (2.5/5/10GBASE-T1), 10 Gbps and Beyond, and IEEE P802.1DG automotive time sensitive network (TSN) profile(s) will take advantage of increased ECU processing capabilities. Such hardware and software solutions should be implemented in combination to accommodate data volume by increasing the physical port speeds while maintaining or decreasing the communication “wired” latency. These future tools will also be used to maintain the predictive, deterministic nature of the data that is required by adaptive applications.



*Compound Annual Growth Rate of Adaptive and Automated Applications*

Next-generation vehicle technology will require adaptive applications, adaptive enablers and the IVN to provide better safety mechanisms, via adaptive ecosystem-aware technologies that can eliminate the human error factors involved in vehicular accidents.

Learn how Molex Connected Mobility Solutions can help engineers take the important steps required for IVNs to support the deterministic data nature of these adaptive and enabler technologies.

To learn more [www.molex.com/connected-mobility](http://www.molex.com/connected-mobility)

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