

# Vehicle Technology Resource Alerts

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## Connected and Autonomous Vehicles (CAVs)

- **What it is:** Connected and Autonomous Vehicles are emerging market segments based on vehicle technologies developed to automate vehicle systems for safer driving, convenience, improved mobility and performance.
- **How it Works:** CAVs integrate automotive and consumer electronics through systems of sensors, hardware and software.
- **Why it's Hot:** The connected-car market is growing at a five-year compound annual growth rate of 45% which exceeds the overall car market by 10 times.

### Connected Vehicles

Connected vehicles exchange data with other vehicles through Vehicle-to-Vehicle (V2V) communications and with the roadside through Vehicle-to-Infrastructure (V2I) communications including location, speed, and direction through devices connected to a secure dedicated short range communication network known as DSRC. Connected vehicle technologies are creating new aftermarket business and growth opportunities equipping new, and retrofitting existing vehicles with radars, lidars and camera-based systems that can keep a car in its lane or warn drivers of dangerous situations, such as a car slipping on ice around an upcoming curve, a car likely to run a red light ahead, or provide information to drivers on eco-operation and fuel efficiency performance. Communication devices embedded in the roadside infrastructure manage the flow of traffic including timing lights for optimal traffic flow. Bicycles, motorcycles and pedestrians can also be connected via portable devices.

### Automated Vehicles

Automated vehicles allow certain driving functions like acceleration, braking and steering to be machine-activated by software and hardware technology built into the vehicle. Automated vehicle systems can vary in the number of functions that are automated and the range of driving environments. Automation and advanced driver assistance systems known as ADAS, requires a variety of sensors, microcontrollers, computers, connections and maps to create situational awareness as well as robotic functionality to complement the role of the human driver.

### Autonomous Vehicles

Autonomous vehicles have all of the necessary sensors, decision-making software, hardware and control features to see, sense and respond to the environment and actually drive themselves without input from the driver. Autonomous and self-driving vehicles respond to what they sense around them, just as human drivers do. CAVs are connected to other technologies like updating of maps and GPS systems. NHTSA and SAE have defined five levels of vehicle automation for CAVs that are described in another Vehicle Technology Resource Alert. Deployment of fully autonomous, Level -5 vehicles in the U.S. will begin with several thousand vehicles in 2020, which will grow to nearly 4.5 million vehicles by 2035, according to IHS Automotive.

To learn more about how CAV technologies and trends are transforming the performance aftermarket industry and creating new business and product opportunities contact [John Waraniak, Vice President of Vehicle Technology](#), or [Bryan Harrison, SEMA Director of Networks](#).

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