Self-driving cars are not all created equal. While researchers predict 8 million autonomous vehicles will be on the road by 2025, their self-driving capabilities will differ. SAE International updated the SAE J3016 in 2021 to clarify how the automotive industry can define driver support systems and advanced driver assistance systems.

At this level, the human driver is entirely in control and performs all the dynamic driving tasks (DDT). Cars with active safety systems that may provide alerts or momentary emergency actions. Such subsystems as blind-spot detection, stability control, forward-collision warning, or automatic emergency braking are considered level 0 because the safety systems do not drive the vehicle.

Level 1 is the simplest form of vehicle automation with at least one driver support. The system can perform a sustained and operational design domain (ODD) specific subtask in either the lateral or longitudinal direction as part of a DDT automation. The driver must supervise the driving automation system by performing the object and event detection and response (OEDR) and other dimensions of the vehicle motion. The automation is short-term and meant to assist the driver.

In comparison to Level 1, Level 2 performs DDT automation for longer periods. The ODD performs extended motion in the lateral and longitudinal direction, but the driver is still expected to have their hands on the wheel for any emergency OEDR actions. The SAE J3016 classifies this as automated movement under the driver's supervision.

The Level 3 of self-driving automation is a significant step up from Level 2 and is not legal yet on U.S. roads. Conditional driving automation introduces sustained and ODD-specific performance by an automated driving system (ADS). Here the driver is not constantly supervising the vehicle but instead is on standby and must be ready to take control in an emergency. However, the car is driven entirely by the ADS and artificial intelligence software to make movement decisions based on its environment. An example of Level 3 driving is a vehicle capable of performing all DDT in a low-speed area or in stop-and-go freeway traffic.

The highest level of automation, Level 5, requires no human interaction whatsoever. The route planning, the vehicle DDT, and the transitions between low and high-speed zones are controlled entirely by the ADS. These vehicles are not bound geographically, nor are they affected by external conditions such as weather or congested traffic environments. The only human action needed is to pick a destination.

No Driving Automation

Driver Assistance

Partial Driving Automation

Conditional Driving Automation

High Driving Automation

Full Driving Automation

The majority of cars on the road today are Level 0.

No Driving Automation

Driver Assistance

Partial Driving Automation

Conditional Driving Automation

High Driving Automation

Full Driving Automation

Level 0: No Driving Automation

Level 1: Driver Assistance

Level 2: Partial Driving Automation

Level 3: Conditional Driving Automation

Level 4: High Driving Automation

Level 5: Full Driving Automation

THE LEVELS OF AUTOMATION IN VEHICLES BREAKS DOWN INTO SIX DIFFERENT CATEGORIES:

No Driving Automation

Driver Assistance

Partial Driving Automation

Conditional Driving Automation

High Driving Automation

Full Driving Automation

The majority of cars on the road today are Level 0.

The majority of cars on the road today are Level 0.