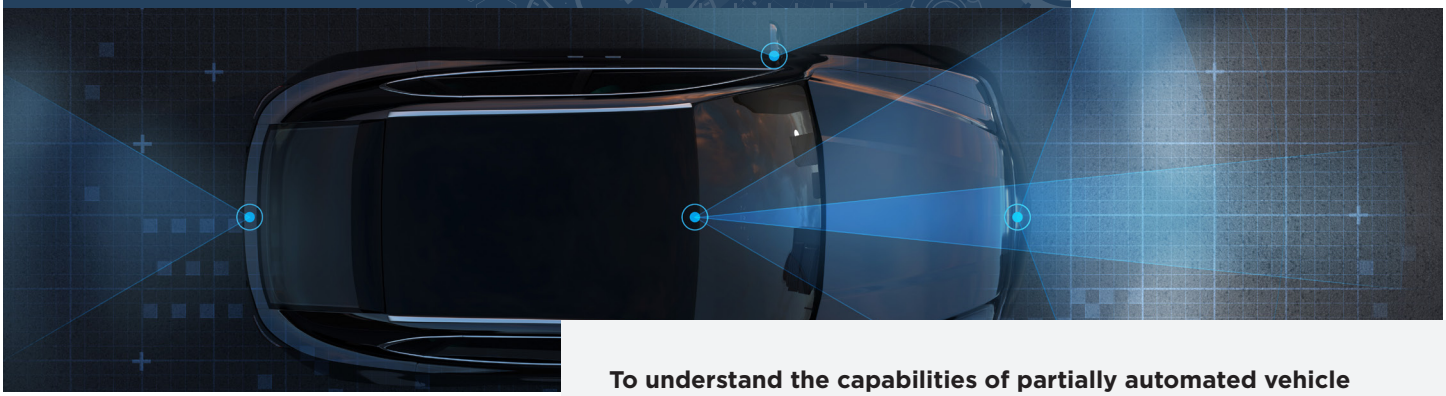
FACT SHEET

LEVEL 2 AUTONOMOUS VEHICLE TESTING



Background

Automotive manufacturers continue to develop sophisticated vehicle systems to assist with the driving task, reduce the likelihood of a crash and introduce increased levels of automated technology. However, today's partially automated driving systems have inconsistent and confusing names, making it more challenging for consumers to understand their actual capabilities.

AAA's research shows that four-in-ten Americans misjudge partially automated driving systems' ability based on names like Autopilot, ProPILOT and Pilot Assist.

To assess the actual capability of this technology, AAA conducted primary research to determine how partially automated vehicle systems performed in common driving conditions.

Testing was done on both a closed course, to simulate common dynamic driving scenarios, and on public highways, to evaluate performance in naturalistic environments, using four test vehicle equipped with these systems.

To understand the capabilities of partially automated vehicle systems in common driving conditions, AAA pursued the following line of inquiry:

How do vehicles equipped with partially automated vehicle systems perform during scenarios commonly encountered on public roadways?

Key Findings

During real-world driving, lane-keeping events accounted for 88 percent of events requiring driver intervention.

- Systems generally performed best on open freeways and freeways with stop and go traffic.
- Systems were challenged on freeways with moderate traffic and by urban driving along surface streets.

During closed-course testing, vehicles performed according to expectations.

- With no lead vehicle to follow, test vehicles maintained lane position with little to no difficulty.
- Three out of the four test vehicles were influenced by the presence of a simulated distracted/impaired lead vehicle.
- All test vehicles recognized a slower tow truck and reduced speed accordingly.
- Three out of four test vehicles required driver intervention to avoid colliding with a simulated stationary target.

Four-in-ten (40%) Americans would expect partially automated car systems with names such as Autopilot, ProPILOT or Pilot Assist to have the ability to drive the car by itself.

- Millennials (59%) and Generation X (40%) are more likely to expect that these systems have the ability to drive the car by itself than Baby Boomers (27%).

Levels of Autonomy*

Many vehicles on the road today are equipped with some type of partially automated vehicle system, however, drivers may not be aware that these are classified by the level of automation.

CURRENTLY AVAILABLE:	
Level 0	No sustained automation; driver is required to maintain full control of the vehicle at all times *Conventional cruise control, anti-lock brakes, automatic emergency braking*
Level 1	Some driver assistance available; driver must remain engaged and perform driving tasks *Lane keeping assist, adaptive cruise control, blind spot monitoring*
Level 2	Partial driving automation through one system that controls steering to maintain lane position and forward motion to maintain either a set speed or appropriate following distance. Driver must remain engaged and perform driving tasks
NOT YET AVAILABLE FOR PUBLIC PURCHASE:	
Level 3	Vehicle is capable of performing the entire driving task within **specific** environments; driver is expected to assume full control when prompted by the vehicle
Level 4	Vehicle performs the entire driving task within **specific** environments; driver is **not** expected to assume any control of the vehicle at any time
Level 5	Vehicle performs the entire driving task in **any** environment; driver is **not** expected to assume any control of the vehicle at any time

*As defined by SAE International

Methodology

To assess the capabilities of partially automated vehicle systems, AAA conducted primary research in partnership with the Automotive Club of Southern California's Automotive Research Center in Los Angeles, California. Track testing was conducted on closed surface streets on the grounds of Auto Club Speedway in Fontana, California. Public highway evaluation was conducted on surface streets, highways and limited-access freeways throughout the greater Los Angeles area.

Four test vehicles were selected (2018 Mercedes-Benz S-Class, 2018 Nissan Rogue, 2017 Tesla Model S and 2019 Volvo XC40) using the following criteria: autonomous driving operation is not limited to LIDAR mapped interstates, ability for autonomous systems to function at speeds up to 70 mph and variety of manufacturers. Additionally, it was required that the system of the selected test vehicle be capable of activation through a single action, in other words, if two actions are required to achieve lateral and longitudinal vehicle control, the vehicle was deemed ineligible for testing regardless of any apparent simultaneous operating ability. Test vehicles were outfitted using industry-standard instrumentation, sensors and cameras to capture vehicle dynamics, position data and braking intervention.

AAA Recommends Drivers:

- Request a full demonstration before leaving the dealership, asking questions about features and limitations
- Become familiar with the vehicle owner's manual.
- Remain engaged in the driving task and maintain control of the vehicle at all times.
- Avoid using these systems on urban surface streets with many intersections and on roadways with significant curving.

The consumer survey was conducted October 4–7, 2018, using two probability samples: randomly selected landline telephone numbers and mobile (cell) phone numbers. The combined sample consisted of 1,003 adults (18 years old and older) living in the continental United States. The margin of error for the study is 4% at the 95% confidence level. Smaller subgroups will have larger error margins.

Generation groups defined as: Millennials (20–37 years old), Generation X (38–53 years old), and Baby Boomers (54–72 years old).