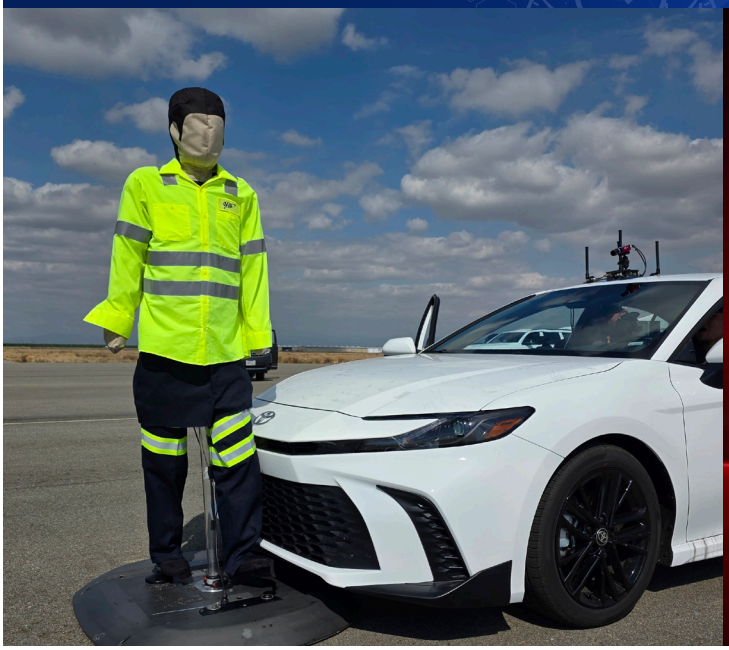
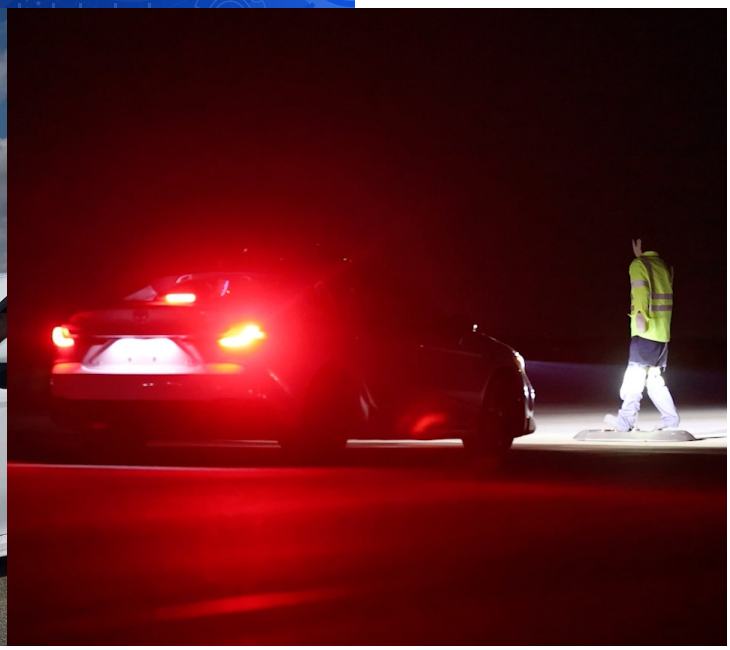
OCTOBER 2025

FACT SHEET

PEDESTRIAN AUTOMATIC EMERGENCY BRAKING EVALUATION

Nighttime Effectiveness and High-Visibility Clothing





Background

Pedestrian Automatic Emergency Braking (PAEB) is an Advanced Driver Assistance System (ADAS) feature designed to detect potential collisions with pedestrians and respond accordingly. Using onboard sensors and advanced processing, PAEB systems can automatically apply the brakes if a collision with a pedestrian is imminent and the driver does not react in time. This technology aims to prevent or reduce the severity of vehicle-to-pedestrian collisions whenever possible. While advancements have enhanced the performance of PAEB in standardized tests, challenges still exist in real-world conditions, such as low-light environments and situations where pedestrians wear high-visibility clothing commonly used by first responders and road workers.

In partnership with the Automobile Club of Southern California's Automotive Research Center, AAA conducted primary research to evaluate the performance of 2024 and 2025 model year vehicles with pedestrian detection systems in a controlled closed-course environment, using an industry-standard adult pedestrian target perpendicularly crossing. Each system was evaluated at 25 mph under both daytime and nighttime conditions, with the pedestrian target wearing standard, non-reflective clothing and an ANSI Class 3 high-visibility clothing ensemble.

**Test procedures were designed to mirror those used in AAA's 2019 PAEB study to enable direct comparison of those results for the nighttime condition.*

To understand the current capabilities and performance of pedestrian detection systems, AAA pursued two lines of inquiry in simulated scenarios:

1. How has the nighttime pedestrian detection performance of the evaluated PAEB systems changed compared to the 2019 evaluation at nighttime?
2. How does outfitting the pedestrian target with high visibility clothing affect the performance of the evaluated PAEB systems during both day and night testing in the same scenario?

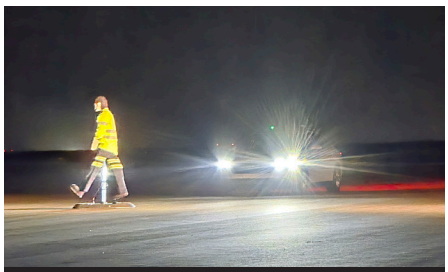
Key Findings

1. Overall, nighttime PAEB impact avoidance improved from 0% in 2019 to 60% in 2025.
2. ANSI Class 3 high-visibility clothing had:
   a. Daytime: no negative effect on PAEB performance, avoiding a collision 95% of the time.
   b. Nighttime: varied PAEB responses, ranging from improved avoidance to complete loss of detection.

AAA Recommendations:

- Pedestrian Automatic Emergency Braking (PAEB) systems are never a substitute for an engaged driver. Do not rely on pedestrian detection systems to prevent a crash.
- Drive with extra caution at night, as this is the riskiest time for pedestrians. Drivers should be fully aware of their surroundings, as these systems rely on sensors that are typically mounted on the front bumper area of the vehicle.
- Remember to stay alert! Engaging in risky driving behaviors such as speeding, texting, driving while drowsy or distracted, or driving under the influence of cannabis or alcohol significantly increases the risk of a collision. Follow speed limits, keep your smartphone out of reach, and only drive when sober.
- Read the owner's manual to understand what safety systems the vehicle is equipped with and how they operate.
- Drivers are responsible for yielding to pedestrians, but those traveling on foot should also be vigilant. Pedestrians should stay cautious by staying on sidewalks and using crosswalks whenever possible. Always obey traffic signals, look both ways before crossing the street, and refrain from walking and texting or engaging with your phone. Be extra careful at nighttime, even while wearing high-visibility clothing.

Daytime testing of pedestrian detection systems high-visibility clothing.



Nighttime testing of pedestrian detection systems high-visibility clothing.

Methodology

In partnership with the Automobile Club of Southern California's Automotive Research Center, closed-course testing was conducted on roadways specifically designed for standardized ADAS testing on the grounds of Minter Field Airport in Shafter, California.

All test scenarios were conducted on a vehicle dynamics pad comprised of straight, flat, dry asphalt free of visible moisture, potholes, or irregularities that could affect the trajectory of the test vehicles or target.

Four test vehicles were selected: the 2024 Honda Accord, the 2025 Toyota Camry, the 2025 Chevrolet Malibu, and the 2025 Tesla Model 3. Each vehicle was evaluated under controlled day and night conditions, traveling at a constant speed of 40 km/h (25 mph) toward a perpendicular crossing pedestrian. Tests compared results from 2019 with standard and ANSI Class 3 high-visibility clothing, recording system warnings, braking responses, and outcomes. Complete methodology can be found in the full research report here.