

FACT SHEET

AUTOMATIC EMERGENCY BRAKING WITH PEDESTRIAN DETECTION



Background

On average, a pedestrian is killed every 88 minutes in traffic crashes in the United States, totaling almost 6,000 people per year. The first pedestrian detection system came to market in 2011 using both radar and image sensors to detect possible collisions with pedestrians as well as with other vehicles. While these systems are intended to help mitigate a collision, they are not intended to replace an engaged driver. Pedestrian detection systems are designed for specific scenarios, but the technology may not always perform as intended or in real-world scenarios such as a child darting from between two parked cars or detecting a pedestrian at night.

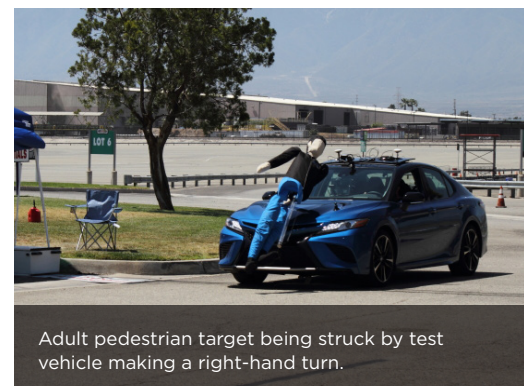
AAA conducted primary research to evaluate the performance of pedestrian detection systems in common scenarios where drivers may encounter pedestrians. Testing was performed on a closed-course using industry standard test equipment to simulate dynamic interactions between vehicles and pedestrians.

Key Findings

1. Pedestrian detection systems were significantly challenged in the following simulated test scenarios:
 - a. When encountering a child at 20 mph, a collision occurred 89% of the time.
 - i. At 30 mph, none of the test vehicles avoided a collision with the pedestrian.
 - b. When encountering an adult immediately after a right-hand turn, none of the test vehicles avoided a collision with the pedestrian or mitigated the impact speed.

To understand the capabilities of pedestrian detection systems, AAA pursued three lines of inquiry in simulated scenarios:

1. How do pedestrian detection systems perform when encountering an adult crossing the road with a vehicle approaching at 20 mph and 30 mph?
2. How do pedestrian detection systems perform in the following scenarios:
 - a. Child darting into traffic from between two parked cars with a vehicle approaching at 20 mph and 30 mph
 - b. Vehicle turning right onto an adjacent road with an adult crossing simultaneously
 - c. Two adults alongside the road with a vehicle approaching at 20 mph and 30 mph
3. How do pedestrian detection systems perform when encountering an adult crossing the road at night with a vehicle approaching at 25 mph?



Adult pedestrian target being struck by test vehicle making a right-hand turn.



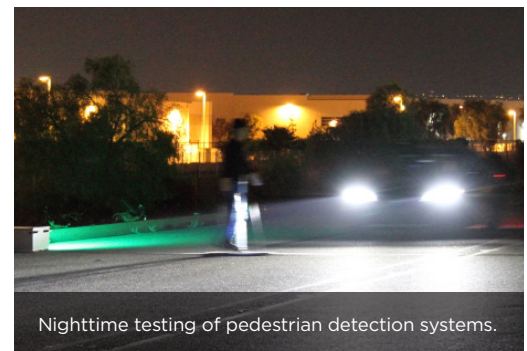
- c. When encountering two adults alongside the road at 20 mph, a collision occurred 80% of the time.
 - i. At 30 mph, only one test vehicle avoided collision with the pedestrian in 1 out of 5 runs.
2. When encountering an adult crossing the road at night, pedestrian detection systems were ineffective.
3. When encountering an adult crossing the road during the day:
 - a. At 20 mph, a collision with the pedestrian was avoided 40% of the time.
 - b. At 30 mph, only one test vehicle avoided collision with the pedestrian in 2 out of 5 runs.

AAA Recommendations:

New vehicle technology can alert drivers and assist in lessening the likelihood or severity of a crash – whether with another vehicle or even more importantly, a pedestrian. But, until these systems are proven to perform consistently AAA recommends drivers:

- Always be alert of their immediate surroundings. Do not rely on pedestrian detection systems to prevent a crash. This technology should only serve as a backup and not a replacement for an engaged driver.
- Know what safety systems the vehicle is equipped with and how those work. Before leaving the lot, ask the dealer to explain how these systems work, including what safety system alerts sound and look like and what triggers their activation.
- Use extra caution when driving at night since this is the riskiest time for pedestrians and where the systems struggled the most. [Previous AAA research](#) found that headlights, even in new condition, do not provide the amount of light needed for drivers to appropriately react to something or someone in the roadway.

It is a driver's responsibility to yield to pedestrians, but those traveling by foot should be diligent as well. Pedestrians should use caution by staying on sidewalks and using crosswalks as often as possible. Always obey traffic signals, look both ways before crossing the street and do not walk and text.



Methodology

To assess the capabilities of pedestrian detection 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.

Four test vehicles were selected (2019 Chevy Malibu, 2019 Honda Accord, 2019 Tesla Model 3 and 2019 Toyota Camry) using specific criteria and each test vehicle was outfitted using industry-standard instrumentation, sensors and cameras to capture vehicle dynamics, position data and visual notifications from the pedestrian detection system. Three simulated pedestrian targets were used including two dynamic models and were outfitted with industry-standard instrumentation to time movement as well as receive position, speed and acceleration from the dynamic target. [Complete methodology can be found in the full research report here.](#)