The Truth about Automatic Emergency Braking

Discussions concerning the safety of our nation's highways continue to intensify, especially considering the advent and development of advanced driver-assist systems (ADAS), such as forward collision warning, adaptive cruise control, lane departure and lane-keeping assistance, and automatic emergency braking. While developers and manufacturers continue to improve upon these technologies, it is imperative to recognize that ADAS are still in their infancy. It is equally as important to recognize what they can and cannot do. These technologies certainly hold potential, but they also pose new problems.

Automatic emergency braking (AEB) systems include a combination of forward-looking sensors, driver alerts, and automatic vehicle braking. These systems are designed to help reduce or prevent a vehicle from striking the rear-end of another vehicle. AEB systems are not autonomous, the driver must retain control of the vehicle at all times to help mitigate or prevent the crash.[1]

Effectiveness

Most AEB systems are designed to only work at low speeds as sudden braking at higher speeds can startle a driver, leading to erratic driving behavior. Most AEB systems lack sophisticated situational awareness, meaning they may not be able to recognize if an object ahead is in the current travel lane or the next lane over—and whether it is a temporarily stopped car, a pedestrian, or a bag of garbage. Thus, most systems do not brake for obstacles when the vehicle is traveling at high speeds. According to an industry analyst at Navigant, "If you're at lower speeds, at 30 mph, and it detects a stationary object, these systems will generally respond and slow the car down and bring it to a stop. When closing speed is above about 50 mph, if it sees a stationary car, it's going to ignore that.[2]"

Reliability

It would cost $42.1 billion to retrofit the entire U.S. fleet of large trucks

In 2016, NHTSA released a study to analyze the performance of collision avoidance systems (CAS), including AEB. Through the one-year study, NHTSA collected 85,000 hours of driving and 885,000 CAS activations for 169 drivers operating 150 Class 8 trucks from seven different carriers. From the data 6,000

[1] Virginia Tech Transportation Institute, *Leveraging Large-Truck Technology and Engineering to Realize Safety Gains: Automatic Emergency Braking Systems*, AAA Foundation for Traffic Safety (Sept 2017).

[2] Timothy B. Lee, "Why emergency braking systems sometimes hit parked cars and lane dividers," Ars Technica (June 2018), https://arstechnica.com/cars/2018/06/why-emergency-braking-systems-sometimes-hit-parked-cars-and-lane-dividers/

CAS activations were sampled. The study found that 85% of the activations were either advisory, with the driver already responding before the alert, or false.[3]

Initial surveys showed mixed opinions of the AEB technology. In follow-up interviews, some safety managers cited concerns that AEB may not be appropriate in winter conditions and that false activations could cause problems, particularly during winter.[4]

Costs

According to a report authored by the Virginia Tech Transportation Institute in 2017, the average AEB system costs $2,500 per truck. The report found that it would cost $41.2 billion at 0% discounted rate to retrofit the entire U.S. fleet of large trucks with AEB systems, and $1.1 billion to equip all new large trucks only. The costs were greater than the estimated benefits in almost every scenario when retrofitting all trucks. When equipping only new trucks, only the high efficacy scenario, where AEB's were estimated to be 28% effective, were the benefits greater than the costs.[5]

Conclusion of AAA Study

VTTI concluded by stating, "These results provide insight into the feasibility of government regulation for large-truck automatic emergency braking systems. There was ***not*** a strong case for government regulation requiring automatic emergency braking systems for the entire U.S. fleet of large trucks given the cost/efficacy rates used in this study.[6]"

> *"There was not a strong case for government regulation requiring automatic emergency braking systems…"*

Although advancements in ADAS technology are impressive, a number of challenges remain, including the effectiveness, reliability, and cost of these systems, such as AEB. While some proponents are eager to push such technologies as a panacea for highway safety, OOIDA implores caution. A hurried mandate of ADAS-equipped trucks is an imprudent approach with possibly devastating consequences upon owner-operators, professional drivers, and the motoring public. Instead, improved entry-level driver training standards will have a far more positive and a far more reaching impact than pushing unproven technology, and at a much-reduced price tag.

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[3] K. Grove et al., *Field Study of Heavy-Vehicle Crash Avoidance Systems*, NHTSA (June 2016).
[4] Ibid., pg. 26
[5] *Leveraging Large-Truck Technology and Engineering to Realize Safety Gains: Automatic Emergency Braking Systems*
[6] Ibid., pg. ix