

How Your Operation Can Leverage ADAS to Save Money & Save Lives. . .

What Can Be Done?

ADAS helps drivers avoid crashes, whether they result from driver error or from circumstances outside the driver's control, such as sudden intrusions into the driver's lane (e.g., road hazards, other vehicles).

ADAS technologies are especially helpful for avoiding or mitigating the impact of rear-end crashes, which represent nearly half of all two-vehicle crashes.

Available ADAS Solutions

There are many types of ADAS solutions now available which have the most potential to prevent fatalities, injuries, and crashes. These include:

- automatic emergency braking, and adaptive cruise control systems,
- lane keep assist, lane centering, and adaptive steering control,
- lane departure, forward collision, and blind spot detection), and;
- driver- and road-facing cameras for driver training, and camera-based mirror systems for enhancing driver field-of-view).

ADAS technology can alert drivers to impending danger ahead of or on the side of the vehicle, maintain safe travel distances between vehicles, and warn drivers if they perform a maneuver that could increase the risk of a crash (such as a sudden lane change). Some systems even initiate braking if drivers don't (or can't).

The National Highway Traffic Safety Administration (NHTSA) estimates that automatic emergency braking could prevent more than 11,000 crashes, 7,700 injuries, and more than 170 deaths involving heavy vehicles.^[2]



What's more, researchers from the University of Michigan Transportation Research Institute indicated that lane departure warning reduced crashes by 14 percent, electronic stability control by 19 percent, forward collision warning by 14 percent, and blind spot detection by five percent.^[3] Moreover, trucks equipped with forward collision warning had 22 percent fewer crashes and trucks with AEB had 12 percent fewer crashes than those without either technology. Forward collision warning and AEB reduced rear-end crashes — the specific type of collision they're designed to prevent — by 44 and 41 percent, respectively.^[4]



Crashes Cost Plenty

There are plenty of costs associated with crashes:

- Direct losses (e.g., vehicle damage, towing).
- Medical and injury costs.
- Cargo damage.
- Indirect losses such as fines and penalties.
- Crash investigation, punitive damages and other legal costs.
- Loss of revenue and increased downtime.
- Public image.
- Increased insurance premiums.
- Lost clients, customers, sales, productivity, etc.
- Cost of hiring or training replacement workers.
- Accelerated depreciation of equipment.

According to industry research, median crash costs can range from a low of \$18,000 when property

^[2] A Target Population for Automatic Emergency Braking in Heavy Vehicles, (July 2017), National Highway Traffic Safety Administration (NHTSA)

^[3] Deploying Safety Technologies in Commercial Vehicles, B. M. Belzowski, (January 2015), University of Michigan Transportation Research Institute

^[4] "Study shows front crash prevention works for large trucks too," Insurance Institute for Highway Safety, September 3, 2020; <https://www.iihs.org/news/detail/study-shows-front-crash-prevention-works-for-large-trucks-too>

damage is involved, to well over \$5 million when fatalities occur. ADAS may help industry stakeholders reduce or avoid these costs.

How Does ADAS Save Money?

ADAS requires some investment, but the returns on that investment or ROI can be significant. ADAS may:

- \$ Detect risky driving behaviors.
- \$ Improve driver retention.
- \$ Prevent collisions and reduce crash severity.
- \$ Improve compliance and safety scores.
- \$ Lower operating costs.
- \$ Improve vehicle maintenance.
- \$ Improve shipper and receiver satisfaction.

For example, forward collision warning and automatic emergency braking costs ranges from \$600 to \$1,200 per vehicle. Typical ADAS bundles offer multiple features with a typical cost of about \$4,200.^[5] But, about one in three crashes are lane departure events, each averaging about \$5,300. Reduced crash costs can hold-down insurance costs for private fleets and owner-operators, while self-insured municipal fleets have the potential to reduce crash-related costs that can exceed \$100 million per year. Within 3-5 years, fleets of all sizes have reportedly experienced lower insurance raises due to their adoption of ADAS.

ADAS offers equipment savings, too. Camera-based mirrors can yield fuel economy improvements of up to three percent — saving thousands per truck per year. Test results confirm vehicles are more aerodynamic when the original factory-installed mirrors are replaced with a camera system that creates less aerodynamic drag.^[6]

^[5] TechCelerate Now Return on Investment Calculator, Phase 1, FMCSA; <https://www.fmcsa.dot.gov/Tech-CelerateNow>

^[6] Fuel Efficiency Study On Rear-View Mirror Camera System, (February 2019), FPIInnovations/PIT Group

ROI Calculation Example

The following example is based on information developed by TechCelerate Now subject matter experts. The example assumes for each new truck, the cost of forward collision warning is \$1,163. Other considerations in the ROI calculations include:

- purchase costs
- training costs
- financing
- discount rate
- maintenance costs
- crash costs
- mileage (crash exposure)
- vehicle/system service life

BOTTOM LINE: The fleet saves \$2.69 for every \$1 invested in ADAS technology. — In the following example, this fleet had 50 trucks traveling 100,000 miles a year, industry average costs (e.g., labor, insurance, etc.), and experienced crash costs of \$25,000 with 33 percent crash prevention and mitigation. This means ADAS would have saved the fleet \$156,231 with a net benefit of \$1,962 per truck.

Users can enter their own fleet data into the TechCelerate Now Online ROI Calculator at <https://www.fmcsa.dot.gov/Tech-CelerateNow>

STEP ONE: Select an ADAS Technology

Technologies

- AEB — Automatic Emergency Braking
- ACC — Adaptive Cruise Control
- FCW — Forward Collision Warnings
- LDW — Lane Departure Warnings
- BSM — Blind Spot Monitoring
- LKA — Lane Keep Assist
- Road-facing Cameras
- Camera-based Mirror System



STEP TWO: Enter Your Pricing Data

Pricing

Do you want to use an estimated price per unit or enter your own price quote per unit?

Estimated Price Per Unit

Cost per Unit \$ 1,163.00

STEP THREE: Enter Your Fleet Data

Fleet

How many vehicles are you installing the technology on?

50

What is your fleet's average cost of capital? 5%

STEP FOUR: Enter Your Crash Data

Crash Data

Would you like to use industry average crash rates or your own fleet's crash data?

Industry Average Crash Rates

STEP FIVE: Review Your Customized Results

Results

Below are estimates for the net present value, ROI, and payback period for adopting this technology using a 5-year timeframe. Please use the sliding bars to adjust the assumptions about crash prevention and crash mitigation to see how it impacts the potential ROI.

Crash Prevention Effectiveness 33%

Crash Severity Effectiveness 33%

Net Present Value

\$ 156,230.99

Payback Period (years)

2

What's the Problem?

Motor vehicle crashes are a leading cause of preventable death in the U.S. In 2021, 5,991 people died in 5,149 crashes involving large trucks. Additionally that year, there were 110,000 crashes, resulting in 172,000 injuries, according to the Federal Motor Carrier Safety Administration (FMCSA).^[1] Research shows a large percentage of these crashes not the commercial vehicle driver's fault.

What's the Solution?

Advances in vehicle safety technology — called Advanced Driver Assistance Systems (ADAS) — can help substantially reduce the number of these crashes, injuries, and deaths. ADAS works in the background to protect truck drivers from other drivers' inattentiveness and bad behavior. Many of today's vehicles can be specified with ADAS technologies that monitor driver input and the environment around the vehicle and warn the driver when they detect the possibility of a collision. These ADAS-equipped vehicles may also automatically brake or steer the vehicle if the driver does not act to avoid the collision.

What Can I Do?

Adoption of these lifesaving technologies has been slow on Class 3-8 medium- and heavy-duty trucks. While a one-size-fits-all approach will not work for today's diverse industry, owner-operators, small-, medium- and large-sized fleets, vocational operators and leasing operations can all specify ADAS to improve bottom lines and save lives.

Consider spec'ing ADAS technology on your next vehicle purchase or learn how you can add ADAS technology to your existing vehicles at www.techceleratenow.org.

[1] Large Truck and Bus Crash Facts 2021 (Nov. 2023), Federal Motor Carrier Safety Administration Analysis Division

About TechCelerate Now...



U.S. Department of Transportation
Federal Motor Carrier Safety Administration

The Federal Motor Carrier Safety Administration's (FMCSA) new initiative in partnership with the Intelligent Transportation Systems (ITS) Joint Program Office — entitled "**TechCelerate Now**" — is focused on accelerating the adoption of ADAS by the trucking industry to reduce fatalities and prevent injuries and crashes. Many industry leaders are working together on the "**TechCelerate Now**" Program, under the leadership of the American Transportation Research Institute (ATRI), the American Trucking Associations (ATA), ATA's Technology & Maintenance Council (TMC), and the Owner-Operator Independent Drivers Association (OOIDA).



Want more information on the TechCelerate Now Program or How to Specify ADAS on Your Next Truck? Visit www.techceleratenow.org

Look for Bogie, your faithful ADAS companion for highway safety!



A Return on Investment (ROI) Guide to Advanced Driver Assistance Systems (ADAS)

Learn how YOU can use technology to improve your bottom line and save lives.



Accelerate Your Technology...



U.S. Department of Transportation
Federal Motor Carrier Safety Administration

www.techceleratenow.org