

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.

Four Types of ADAS Solutions

There are four general performance categories of ADAS which have the most potential to prevent fatalities, injuries, and crashes:

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

ADAS steering systems 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]



Crashes Cost Plenty

There are plenty of costs associated with crashes:

- Direct losses such as damage to your vehicle and towing expenses.
- 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 damage is involved, to well over \$5 million when fatalities occur. ADAS may help industry stakeholders reduce or avoid these costs.

[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.

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 \$70 to \$316 per vehicle. [4] *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. [5]

[4] Cost and Weight Analysis of Heavy Vehicle Forward Collision Warning (FCW) and Automatic Emergency Braking (AEB) Systems for Heavy Trucks. (September 2018), National Highway Traffic Safety Administration.
[5] Fuel Efficiency Study On Rear-View Mirror Camera System, (February 2019), FPInnovations/ PIT Group

ROI Calculation Example

The following example is based on information developed by VTTI. The example assumes for each new truck, the cost of driver- and forward-facing video is \$525 plus \$40/month service fee and training. 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 \$5.09 for every \$1 invested in ADAS technology. In this example, this fleet had 20 trucks, industry average costs (e.g., labor, insurance., etc.), and experienced four (non-fatal) crashes. This means ADAS would have saved the fleet \$ 277,150 at a cost of \$54,491.*

To enter your own fleet data into the Online ROI Calculator, goto <https://www.tech-celeratenow.org/ROIcalculator>

STEP ONE: COSTS						
EQUIPMENT COSTS						
ADAS Technology	Video					
Number of Trucks	10					
ADAS Unit Cost	\$525					
ADAS Financed (Y/N)	Yes					
Years Financed	3					
Annual Interest Rate (%)	7%					
MACRS Rate	35%					
Depreciation Schedule	33.33% Year 1	44.45% Year 2	14.8% Year 3	7.41% Year 4	0.00% Year 5	
DRIVER						
Salary/Hour	\$19.3					
% Driver Benefits	42%					
% Overhead Costs	27%					
Total Driver Salary Cost/Hr.	\$34.80					
Number of Drivers/Truck	1					
Turnover Rate	100%					
No. of Driver Training Hrs./Yr.	1					



MANAGER					
Salary/Hour	\$24.10				
% Driver Benefits	42%				
% Overhead Costs	27%				
Total Manager Salary/Hour	\$43.50				
Yearly Fee	\$480.00				
Est. Maintenance Costs/Yr.	Year 1	Year 2	Year 3	Year 4	Year 5
ADAS Installation	\$0				
Driver Training	\$0	\$0	\$0	\$0	\$0
Maintenance, etc.	\$0	\$0	\$0	\$0	\$0
Analysis Period	5 yrs.				
Discount rate	0%				

STEP TWO: BENEFITS			
NUMBER OF CRASHES			
Insured or Self-Insured	Insured		
Number of Trucks	20		
What is Your Deductible?	Low/ \$6,000		
Total Vehicle Miles/Yr. (opt.)	1,200,000		
Enter overall crashes or by severity	By Severity		
No. of Years of Crash Data	1		
Crash Severity	No.	Cost	Total Cost
Property Damage Only	3	\$159,989	\$479,967
Injury Crashes	1	\$105,357	\$105,357
Fatal Crashes	0	\$107,050	\$0
Total	4		
Average Crash Costs/Year	\$585,324		
Expected Reduction in Related Crashes	High / 52%		
Average Reduction Crash Cost/Year	\$14,365		
Do You Move High Value Cargo?	Low		
Est. Additional Cargo Value	\$60,000		
Adjusted Avg. Reduction in Crash Costs/Year Due to High Value Cargo	\$21,205		
ADAS Financed?	Yes		
Discount Rate	0%		

STEP THREE: RESULTS		
Results Per Truck	Per Truck	Entire Fleet
Benefits	\$13,857	\$277,150
Costs	\$2,725	\$54,491
Benefits-Costs	\$11,133	\$222,658
Benefit/Cost	\$5.09	\$5.09
Payback Period	12 months	12 months

To enter your own fleet data into the Online ROI Calculator, goto <https://www.tech-celeratenow.org/ROIcalculator>

What’s the Problem?

Motor vehicle crashes are a leading cause of preventable death in the U.S. In 2017, 4,761 people died in 4,237 crashes involving large trucks. Additionally that year, there were 102,000 crashes, resulting in 148,000 injuries, according to the Federal Motor Carrier Safety Administration (FMCSA)^[1].

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. 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 retrofit ADAS technology at www.tech-celeratenow.org.



[1] Large Truck and Bus Crash Facts 2017 (May 2019), Federal Motor Carrier Safety Administration Analysis Division

About Tech-Celerate Now . . .

The Federal Motor Carrier Safety Administration’s (FMCSA) new initiative in partnership with the Intelligent Transportation Systems (ITS) Joint Program Office — entitled “**Tech-Celerate 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 “**Tech-Celerate 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 Tech-Celerate Now Program or How to Specify ADAS on Your Next Truck? Visit www.tech-celeratenow.org



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...



www.tech-celeratenow.org