

Reduce Distracted Driving with Real-Time In-Vehicle AI

Executive summary

In a study involving 30 fleets and nearly 1,400 drivers, artificial intelligence (AI)-powered Driver Behavior Alerts proved to cut driver distraction risk substantially. Fleets now have a new, proven, automated tool to combat distracted driving in real-time.

There's little argument that distracted driving is one of the fastest growing threats to safe driving today. And the statistics support this. Distracted driving is a fast-growing cause of collisions in the United States, accounting for 8.5% of all fatal collisions in 2017 (the latest year for which there is data), resulting in 3,166 deaths, according to the National Highway Traffic Safety Administration (NHTSA).

While we live in an era of safety-conscious fleet management, even the best, most conscientious commercial drivers will likely become distracted at some point during the day — and will need a way to refocus their attention on the road to avoid the risk for a potentially fatal collision.

A recent study conducted by Nauto shows that AI-powered In-Vehicle Alert technology can significantly reduce driver behavior events across all driver and fleet types by 84% and 67% respectively, demonstrating the effectiveness of a proactive real-time solution in the vehicle.

Defining Distracted Driving

In general, distracted driving is anything that inhibits a person from paying full attention to the primary task of safely operating a motor vehicle. This means that the driver is not fully engaged and is unable to adequately respond to changes in the driving environment, which can lead to catastrophic consequences.

The National Highway Traffic Safety Administration (NHTSA) categorizes three types of distracted driving behavior:



Visual

Driver's eyes are off the road



Manual

Driver's hands are off the wheel



Cognitive

Driver's mind is off the driving tasks

A driver may be engaging in one or more distracted driving behaviors at any given time. The result is the same: heightened risk of a crash, injury, or even fatality.

AI-powered Driver Behavior Alert technology is a proven way fleets can combat distracted driving by audibly alerting drivers as soon as they've become distracted for an extended period of time. This allows the driver to correct their behavior proactively, instead of relying on retroactive coaching weeks after an event.

Putting AI-Power to the Test

From September 2018 to April 2019, Nauto conducted a study using its AI-powered driver and fleet safety device with 30 of its customer fleets and nearly 1,400 drivers comprising a diverse array of industries, including Passenger, Services, Distribution, Logistics & Transportation, and Oil & Gas.

Testing was broken into two periods: Pre-Alert and Post-Alert. The Pre-Alert period covered approximately the first two weeks after installation of the Nauto Device, when a driver was fully aware of the device in the vehicle and modified his or her behavior in anticipation of an alert—this period provided a baseline for the driver. During this period no Driver Behavior Alerts were issued. The Post-Alert period covered the time after the Pre-Alert period until the end of the study when the driver had become accustomed to the physical device and was Driver Behavior Alerts were activated to modify his or her behavior.

The study assessed three metrics for measuring the severity of distracted driving behavior:

1	2	3
Event frequency per driving hour	Distracted duration per driving hour	Distance travelled while distracted per driving hour
<i>Total distraction events detected (#)</i>	<i>Total duration of distraction events detected (seconds)</i>	<i>Total distance travelled during distraction events detected (feet)</i>
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<i>Total driving time (hours)</i>	<i>Total driving time (hours)</i>	<i>Total driving time (hours)</i>

RESULTS

Tabulating the Results

The results showed that AI-powered Driver Behavior Alerts can significantly improve drivers’ distraction risk in real-time. This executive summary provides an overview of the results by industry.

Industry Results

Across Nauto’s Passenger, Services, and Other Industries (included Logistics & Transportation and Oil & Gas), the study observed substantial improvements across all three distraction metrics, as shown in Table 1. Prior to the activation of Driver Behavior Alerts, drivers in the Passenger industry triggered distraction events most frequently (5.20 events on average for each driving hour) and the longest duration (16.63 seconds on average per driving hour), followed by Services (4.44 times and 13.97 seconds on average per driving hour), and then Other Industries (3.06 times and 9.39 seconds on average per driving hour).

	Event Frequency Per Driving Hour			Distracted Duration Per Driving Hour (Seconds)			Distance Travelled while Distracted Per Driving Hour (Feet)		
	Pre-Alert	Post-Alert	Difference	Pre-Alert	Post-Alert	Difference	Pre-Alert	Post-Alert	Difference
Driver Average									
 Passenger	5.20	3.77	-27.50%*	16.63	11.50	-30.85%*	797.54	538.91	-32.43%*
 Services	4.44	1.42	-68.02%*	13.97	3.95	-71.73%*	879.82	244.95	-72.16%*
 Other	3.06	1.86	-39.22%	9.39	5.49	-41.53%	465.09	243.24	-47.70%
Driver Median									
 Passenger	2.05	0.98	-52.20%	5.77	2.56	-55.63%	254.36	107.84	-57.60%
 Services	1.75	0.65	-62.86%	5.14	1.66	-67.70%	283.23	88.22	-68.85%
 Other	0.75	0.61	-18.67%	2.25	1.67	-25.78%	91.11	69.59	-23.62%

Table 1. Industry-level summary results by metric

* Indicating that result from two-sample t-test is statistically significant with p-value < 0.001

RESULTS

Industry Results, continued

Of these three industries, Services appeared to improve the most with an average reduction of 67.98% in distraction event frequency, 71.76% in distracted durations per driving hour, and 72.16% in distracted distance per driving hour.

In comparison, drivers in the Passenger industry reduced distraction event frequency per driving hour on average by 27.49%, distracted duration per driving hour by 30.87%, and distracted distance per driving hour by 32.43%.

Across all industries involved in the study, there was an average decrease of 40% in distraction event frequency, 43% in distracted duration, and 47% in distracted distance.

TECH OVERVIEW

AI-Powered Solution for Distracted Driving

Artificial intelligence (AI)-powered Driver Behavior Alert technology is an emerging answer to combatting distracted driving.

Nauto deploys real-time AI and multi-sensor fusion on the in-vehicle device to continuously collect and analyze data. Equipped with GPS, an inertial measurement unit (IMU), and interior and exterior image sensors, the Nauto Device is designed to mount on the upper center portion of the windshield and to help fleets detect and coach drivers in passenger and class 1-8 vehicles in real-time.

Among other high-risk behaviors, the technology currently detects visual distraction, including instances when a driver is looking down for a period long enough to lose situational awareness of the forward-driving scene. Distraction behaviors can include drowsiness, texting, using a cell phone, reviewing paperwork, making adjustments to the radio/infotainment solution, and eating and drinking (non-alcohol).

When the Nauto Device detects a driver is visually distracted, it instantaneously issues three progressive audio alerts based on the duration of the distraction and vehicle speed at the time of the event. To see Driver Behavior Alerts in action, visit www.nauto.com/product



CONCLUSION

Winning the Distraction Battle

With fleet crash rates perpetually hovering at the 20% rate and injury-related collision costs averaging \$70,000 per incident for fleets (twice the cost of the average workplace injury)¹, using AI-powered Driver Behavior Alerts is a cost-effective and proven capability that fleets can use to reduce risk in real-time without management intervention and win the distracted driving battle.

Can you afford not to implement any technology that directly reduces risk?

To learn more about Nauto's Driver Behavior and Fleet Safety Platform and how it can help you combat distraction, improve your drivers' risk profiles, and improve the bottom line, visit www.nauto.com.



Equip your drivers to react with Nauto Predictive Collision Alerts.

Visit: <https://www.nauto.com/product/predictive-collision-alerts>

Metric	Value
Average cost per rear-end collision in the US (per year)	\$82k
Number of rear-end collisions avoided by Nauto Predictive Collision Alerts	27%
Percentage of rear-end collisions avoided by Nauto Predictive Collision Alerts	71%

"We evaluated multiple AI-powered products to support our commitment to driver safety. We expect Predictive Collision Alerts to further reduce our number of rear-end collisions."

— Bob McLeod, Fleet Manager

Nauto® is the only real-time AI-powered, Driver Behavior and Fleet Safety Platform to predict, actively prevent, and reduce high-risk events in the mobility ecosystem. By analyzing billions of data points from over 850 million AI-processed video miles, Nauto's machine learning algorithms continuously improve and impact driver behavior before events happen, not after. Nauto has enabled the largest commercial fleets in the world to avoid more than 50,000 collisions, resulting in nearly \$200 million in savings.

Nauto is located in North America, Japan, and Europe. Nauto is backed by SoftBank Vision Fund Group Corp., Greylock Partners, BMW iVentures, General Motors Ventures, Toyota AI Ventures, Allianz Group, Playground Global and DNX Ventures. More information about Nauto is available at www.nauto.com, or on LinkedIn, Facebook and Twitter.

Reference

1. "Commercial Fleet Accident Rate Reaches 20%." Antich, Mike. Automotive Fleet. May 25, 2018. www.automotive-fleet.com/303123/fleet-safety-metrics-reverse-negatively-accidents-increase. Accessed Sept. 10, 2019.